ORDER NO. SD83072593A4

Service Manual

QUARTZ Synthesizer FM/AM Stereo Receiver

SA-510

[PA], [PE], [PC]

SA-510(K)

[PC]

Areas

[PA]	is available in Far East PX.
[PE]	is available European Military.
[PC]	is available European Audio Club.

***The colors of this model include silver and black.**
***The black type model is provided with (K) in the Service Manual.**

Please use this manual together with the service manual for Model No. SA-510, Order No. SD83052499C1.

CHANGES

■ Specifications

[M]

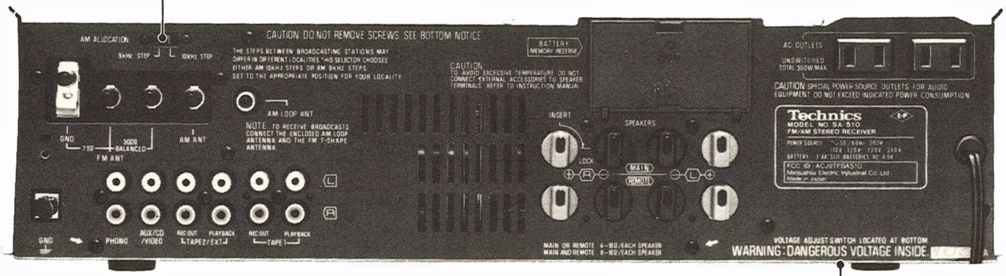
■ FM TUNER SECTION	
Frequency range	87.9 ~ 107.9 MHz
■ AM TUNER SECTION	
Frequency range	530 ~ 1620 kHz
■ GENERAL	
Power consumption	250W, 320VA
Power supply	AC 120V, 60 Hz
Weight	8.3 kg (18.3 lb)

➡

[PA, PE, PC]

■ FM TUNER SECTION	
Frequency range	87.50 ~ 108.00 MHz (50 kHz step)
■ AM TUNER SECTION	
Frequency range	522 ~ 1611 kHz (9 kHz step) 530 ~ 1620 kHz (10 kHz step)
■ GENERAL	
Power consumption	380W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Weight	8.6 kg (19.0 lb.)

■ LOCATION OF CONTROLS (Addition Only)


AM ALLOCATION
9kHz STEP
10kHz STEP
CAUTION: DO NOT REMOVE SCREWS. SEE BOTTOM NOTICE
THE STEPS BETWEEN BROADCASTING STATIONS MAY DIFFER IN DIFFERENT LOCALITIES. THIS SELECTOR CHOOSES EITHER AM 10kHz STEPS OR AM 9kHz STEPS. SET TO THE APPROPRIATE POSITION FOR YOUR LOCALITY.
BATTERY MEMORY RESERVE
CAUTION TO AVOID EXCESSIVE TEMPERATURE, DO NOT CONNECT EXTERNAL ACCESSORIES TO SPEAKER TERMINALS. REFER TO INSTRUCTION MANUAL.
AC OUTLETS
UNSWITCHED TOTAL 300W MAX
CAUTION: SPECIAL POWER SOURCE OUTLETS FOR AUDIO EQUIPMENT. DO NOT EXCEED INDICATED POWER CONSUMPTION.
AM LOOP ANT
NOTE: TO RECEIVE BROADCASTS CONNECT THE ENCLOSED AM LOOP ANTENNA AND THE FM T-SHAPE ANTENNA.
GND
75Ω
300Ω BALANCED
FM ANT
AM ANT
INSERT
LOCK
SPEAKERS
MAIN
REMOTE
Technics
MODEL NO. SA-510
FM/AM STEREO RECEIVER
L
R
GND
PHONO
AUX/CD /VIDEO
REC OUT
PLAYBACK
TAPE2/EXT
REC OUT
PLAYBACK
TAPE1
MAIN OR REMOTE 4~16Ω/EACH SPEAKER
MAIN AND REMOTE 8~16Ω/EACH SPEAKER
VOLTAGE ADJUST SWITCH LOCATED AT BOTTOM
WARNING: DANGEROUS VOLTAGE INSIDE

AM allocation selector (S408)
(9 kHz step↔10 kHz step)

Voltage selector (on the bottom board) S16 (110↔120↔220↔240V)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo
Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shibakoen, Minato-ku, Tokyo 105 Japan

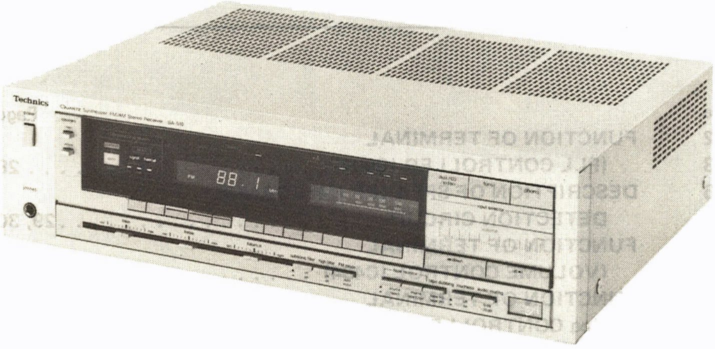
ORDER NO. SD83052499C1

Service Manual

QUARTZ Synthesizer FM/AM Stereo Receiver

SA-510

[M], [MC]



Areas

* [M] is available in U.S.A.
* [MC] is available in Canada.

Specifications (IHF '78)

(Specifications are subject to change without notice for further improvement.)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output 20 Hz~20 kHz both channels driven 0.005% total harmonic distortion	60W per channel (8 ohms)
1 kHz continuous power output both channels driven 0.005% total harmonic distortion	65W per channel (8 ohms)
Dynamic headroom	1.8 dB (8 ohms)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.005% (8 ohms)
half power at 20 Hz~20 kHz	0.005% (8 ohms)
half power at 1 kHz	0.001% (8 ohms)
SMPTE intermodulation distortion	0.01% (8 ohms)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB
AUX/CD/VIDEO, TAPE 1, 2/EXT	5 Hz~100 kHz, −3 dB
Input sensitivity	
PHONO	0.35 mV (2.5 mV, IHF '66)
AUX/CD/VIDEO, TAPE 1, 2/EXT	19 mV(150 mV, IHF '66)
S/N (IHF, A)	
PHONO	74 dB (81 dB, IHF '66)
AUX/CD/VIDEO, TAPE 1, 2/EXT	76 dB (90 dB, IHF '66)
Maximum input voltage	
PHONO	170 mV (170 mV, 1 kHz)
Input impedance	
PHONO	47 kilohms
AUX/CD/VIDEO, TAPE 1, 2/EXT	15 kilohms
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
High filter	7 kHz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
AF muting	−20 dB
Low frequency damping factor	40 (8 ohms) 20 (4 ohms)
Load impedance	
MAIN or REMOTE	4~16 ohms
MAIN and REMOTE	8~16 ohms

■ FM TUNER SECTION

Frequency range	87.9~107.9 MHz
Sensitivity	10.8 dBf (1.9 μV, IHF '58)
50 dB quieting sensitivity	
MONO	16.1 dBf (3.5 μV IHF '58)
STEREO	38.3 dBf (45 μV IHF '58)
Total harmonic distortion	
100 Hz	0.08% (MONO), 0.2% (STEREO)
1 kHz	0.08% (MONO), 0.15% (STEREO)
6 kHz	0.2% (MONO), 0.3% (STEREO)
S/N	
MONO	78 dB
STEREO	72 dB
Frequency response	20 Hz~15 kHz, +1 dB, −2 dB
Alternate channel selectivity	75 dB
Capture ratio	1 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	75 dB
Spurious response rejection at 98 MHz	82 dB
AM suppression	55 dB
Stereo separation	
1 kHz	45 dB
10 kHz	35 dB
Carrier leak	
19 kHz	−40 dB
38 kHz	−55 dB
Antenna terminals	300 ohms (balanced) 75 ohms (unbalanced)

Technics

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Ave, 65 De Infanteria, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

■ AM TUNER SECTION

Frequency range	530~1620 kHz
Sensitivity	20 μV, 300 μV/m
Selectivity	55 dB
Image rejection at 1000 kHz	40 dB
IF rejection at 1000 kHz	40 dB

■ GENERAL

Power consumption	250W, 320 VA
Power supply	AC 120V, 60 Hz
Dimensions (W×H×D)	430 × 120 × 330 mm (16-15/16" × 4-23/32" × 13")
Weight	8.3 kg (18.3 lb.)

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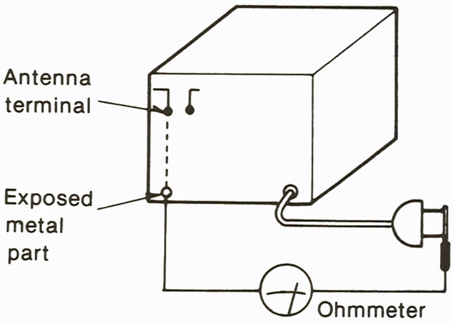
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

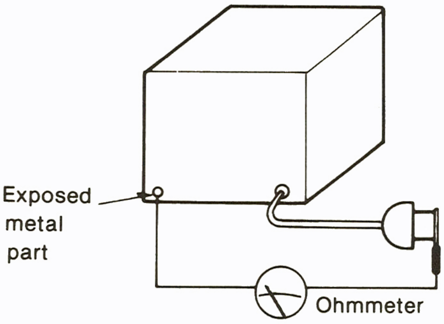
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ

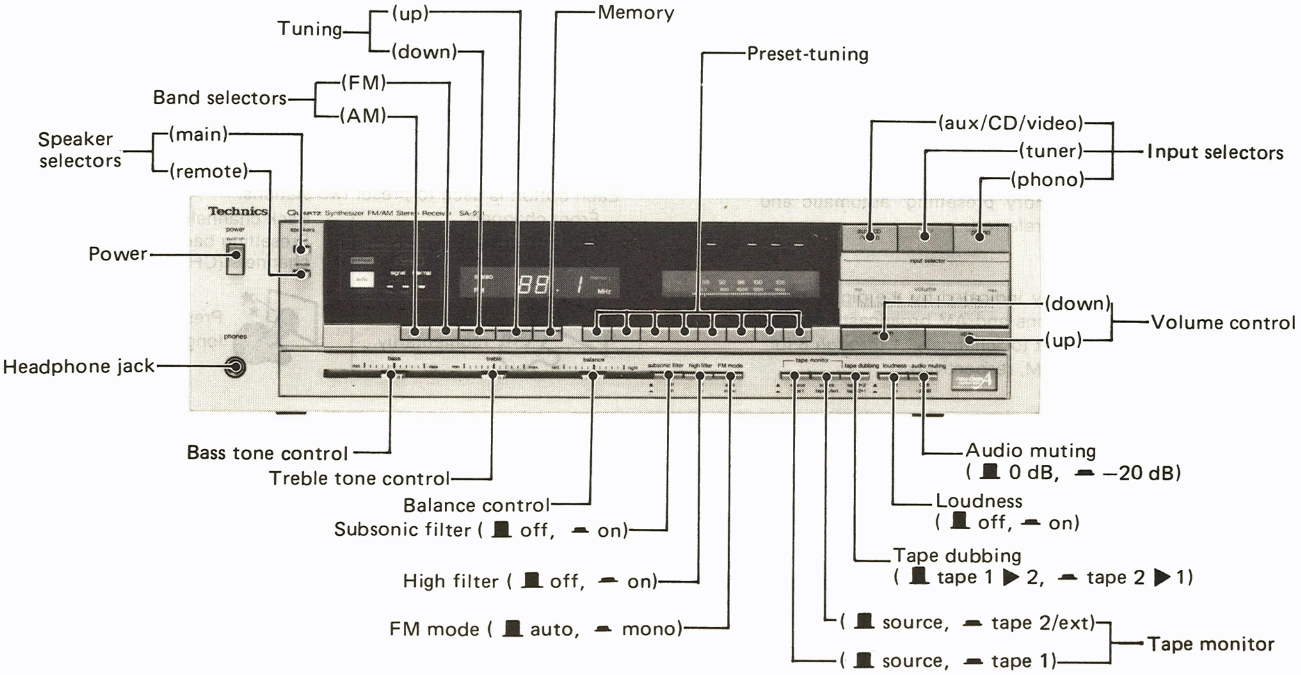


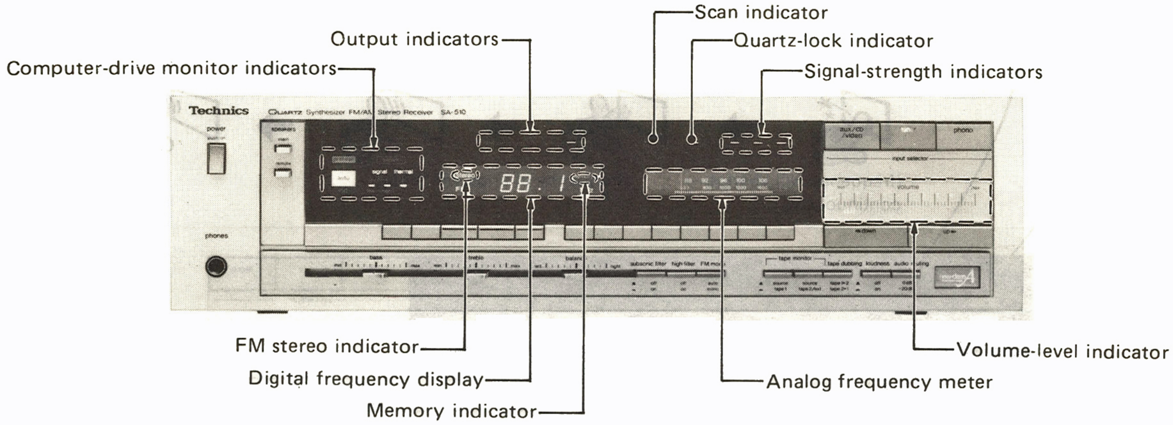
(Fig. B)

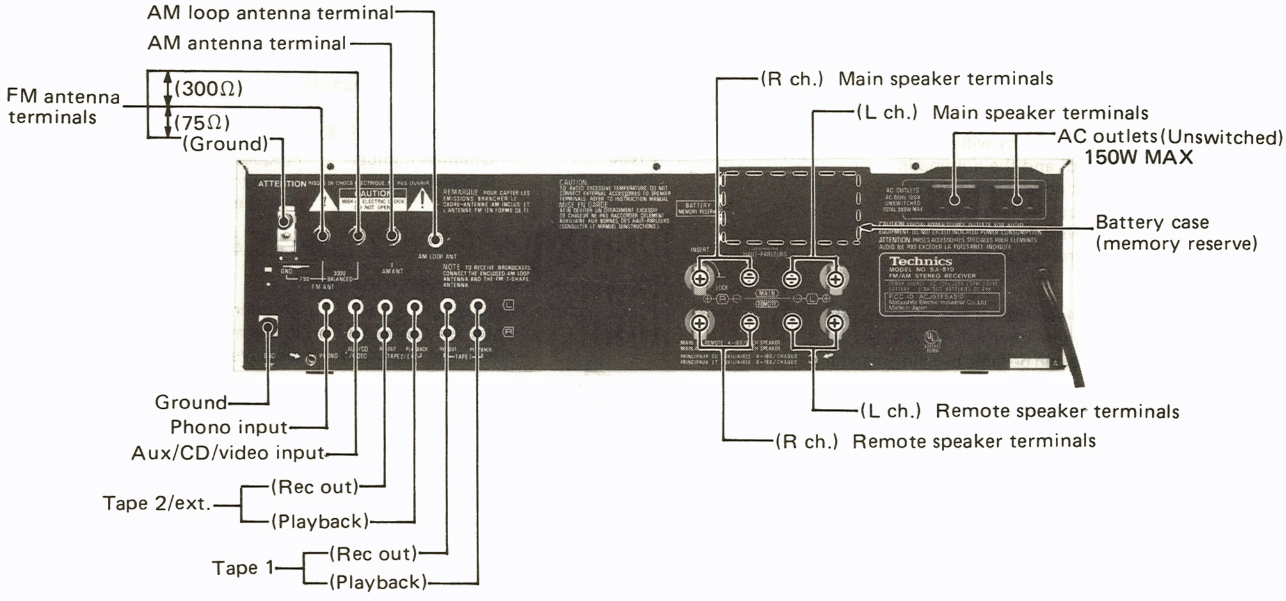
Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS


Tuning
(up)
(down)
Memory
Preset-tuning
Band selectors
(FM)
(AM)
Speaker selectors
(main)
(remote)
(aux/CD/video)
(tuner)
(phono)
Input selectors
Power
(down)
(up)
Volume control
Headphone jack
Bass tone control
Treble tone control
Balance control
Subsonic filter (■ off, ▬ on)
High filter (■ off, ▬ on)
FM mode (■ auto, ▬ mono)
Audio muting (■ 0 dB, ▬ −20 dB)
Loudness (■ off, ▬ on)
Tape dubbing (■ tape 1 ▶ 2, ▬ tape 2 ▶ 1)
(■ source, ▬ tape 2/ext)
(■ source, ▬ tape 1)
Tape monitor


Scan indicator
Output indicators
Quartz-lock indicator
Computer-drive monitor indicators
Signal-strength indicators
FM stereo indicator
Digital frequency display
Memory indicator
Volume-level indicator
Analog frequency meter


AM loop antenna terminal
AM antenna terminal
FM antenna terminals
(300Ω)
(75Ω)
(Ground)
(R ch.) Main speaker terminals
(L ch.) Main speaker terminals
AC outlets(Unswitched) 150W MAX
Battery case (memory reserve)
Ground
Phono input
Aux/CD/video input
Tape 2/ext.
(Rec out)
(Playback)
Tape 1
(Rec out)
(Playback)
(L ch.) Remote speaker terminals
(R ch.) Remote speaker terminals

* Phono input capacitance is about 150pF.

■ HOW TO OPERATE

● Preset radio broadcast frequencies

This unit is used to preset as many as 16 radio broadcast frequencies: FM/AM random presetting. After broadcast frequencies have been preset as described below, any desired station can be quickly and easily selected by simply touching one button.

■ Memory presetting

There are two types of memory presetting: automatic and manual. Select whichever is preferred.

1. Automatic presetting:

Beginning at the frequency indicated by the digital display, the FM broadcasting stations and AM broadcasting stations will be automatically preset to "channels" 1 through 8 for FM and 9 through 16 for AM, respectively.

Note that in mountainous or remote areas, broadcasting stations which have weak broadcasting signals cannot be automatically preset into the memory.

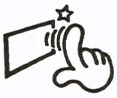
2. Manual presetting:

Stations can be freely preset to any desired channel.

Before memory presetting

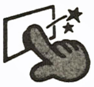
Each button is used to preset two stations.

Front channels
Presetting front
channels (CH 1~8)



Press momentarily.

Back channels
Presetting back
channels (CH 9~16)



Press slightly longer.

● Automatic presetting:

❶ **Power: "on" (■-■)**

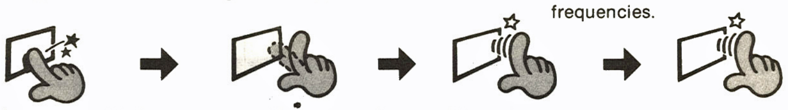
❷
- **To preset an FM station: press the "FM" button.**
- **To preset an AM station: press the "AM" button.**

❸
- **To preset FM broadcasting stations: Set to 87.9 MHz.**
- **To preset AM broadcasting stations: Set to 530 kHz.**

① Press the button and hold slightly (frequency will change continuously).

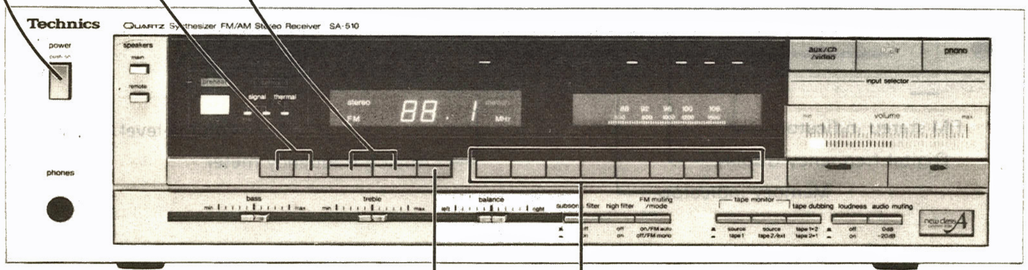
② Release it at 87.9 MHz for FM or 530 kHz for AM, and then press the button again momentarily (frequency change will stop).

③ Press the button momentarily (frequency will change each time the button is pressed), and tune to one of the above frequencies.

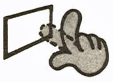


(frequency will change continuously).

(frequency change will stop).


Technics
Quartz Synthesizer FM/AM Stereo Receiver SA-510
power
speakers
main
remote
signal
thermal
stereo
FM
88. 1
MHz
phones
aux/CD /video
phono
input selector
volume
bass
treble
balance
filter
high filter
FM muting /mode
tape monitor
tape dubbing
loudness
audio muting

❹ **Press. When the frequency indication begins to change, release.**



(The frequency will change upward, and the automatic presetting will begin with the broadcasting station of the lowest frequency and will continue in order.)

Notes:

1. In areas where there are less than 8 FM stations, the remaining channels (through channel 8) will be left empty. The empty channels can be filled by using manual memory presetting.
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

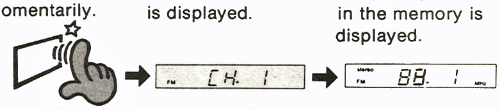
❺ Confirm the names (call signs, etc.) of the broadcasting stations which are preset to each channel.

To check the front channels (CH 1~8):

Press momentarily.

Channel number is displayed.

Frequency stored in the memory is displayed.

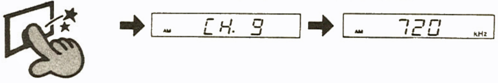

FM CH. 1
stereo FM 88. 1 MHz

To check the back channels (CH 9~16):

Press slightly longer.

Release the button when the channel number is displayed.

Frequency stored in the memory is displayed.


AM CH. 9
AM 720 kHz

• Manual memory presetting

① Power: "on" (▀—▄)

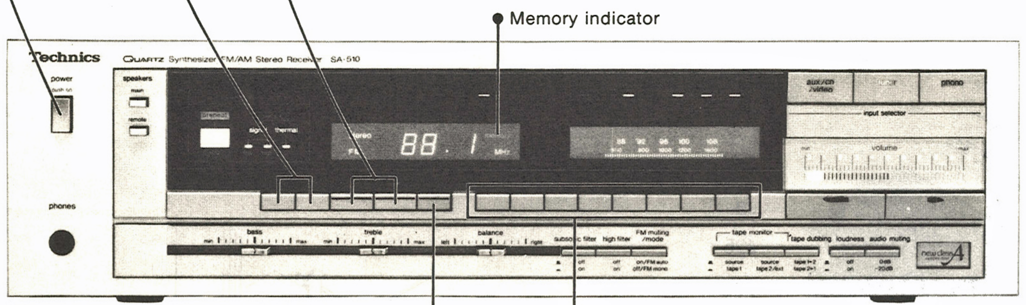
② To preset an FM station: press the "FM" button.
To preset an AM station: press the "AM" button.

③ Press the appropriate tuning button to tune to the desired broadcast.

- **Auto tuning**
  Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.

- **Manual tuning**
  Press the button momentarily and tune to the desired station.

The frequency will change each time the button is pressed.



④ Press momentarily, and then release.

(The memory indicator will illuminate for approximately 4 seconds.)

Note:
If the button is pressed continuously, the frequency will begin to change, and the memory will be preset automatically.
In order to stop the memory presetting, once again press either the "up" button or the "down" button.

⑤ While the memory indicator is illuminated, press the button of the desired channel.

- **To preset channels 1 through 8:**

Press the button momentarily, and then release.

- **To preset channels 9 through 16:**

Press the button slightly longer, and then release.

Note:
1. If the memory indication illumination stops before you press the button, once again repeat step (4) and then step (5).
2. If a new broadcasting station is preset into a channel, the broadcasting station which was previously entered in that channel will be automatically erased.

⑥ Enter the name (call sign, etc.) of the preset broadcasting station on the file sheet (above).

• To listen to radio broadcasts

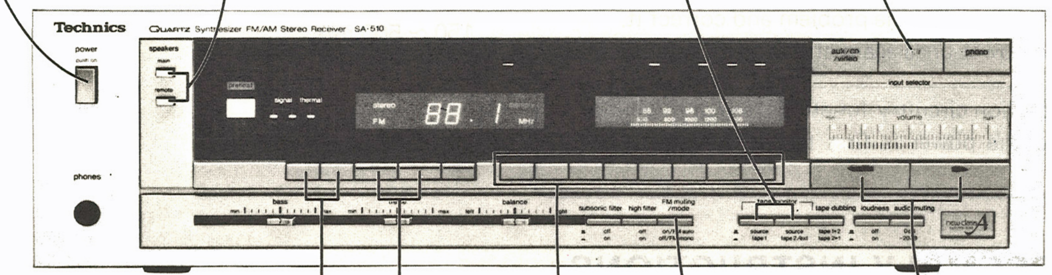
By pressing one of the preset-tuning buttons or the band selectors, the broadcast can be heard without pressing the input selector marked "tuner".

① Power:
"on" (▀—▄)

② Select speaker systems to be used.

③ "source" (▄—▀)

4-1 **Station selection by using the input selectors**
"tuner"



⑤ Adjust volume level.

- If the broadcast signal is weak, or if there is a large amount of interference in a stereo broadcast, set to the "off/FM mono" position.

4-2 **Station selection by using the tuning buttons**

1. Press either "FM" or "AM".
2. Press the left button to change the frequency downward, and press the right button to change the frequency upward.

- **Auto tuning** Press the button. When the frequency indication begins to change, release the button (a broadcasting station will be selected automatically). Repeat this operation until the desired station is found.

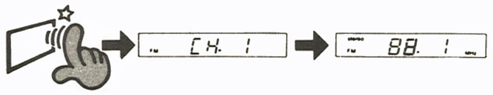
- **Manual tuning** Press the button momentarily and tune to the desired station. The frequency will change each time the button is pressed.

4-3 **Station selection by using preset tuning buttons**

By pressing one of these buttons, the broadcast can be heard.

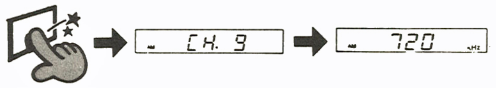
- **To select the front channels (CH1~8):**

Press momentarily. → Channel number is displayed. → Frequency stored in the memory is displayed.



- **To select the back channels (CH 9~16):**

Press slightly longer → Release the button when the channel number is displayed. → Frequency stored in the memory is displayed.

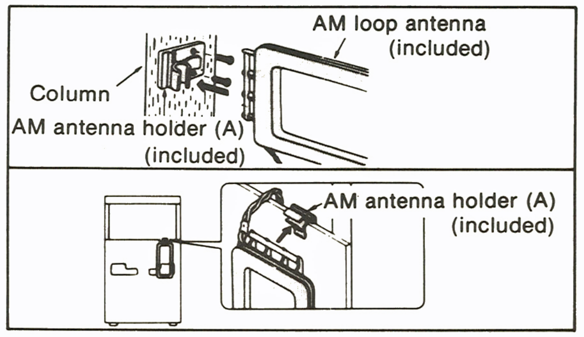


■ HOW TO USE THE AM LOOP ANTENNA

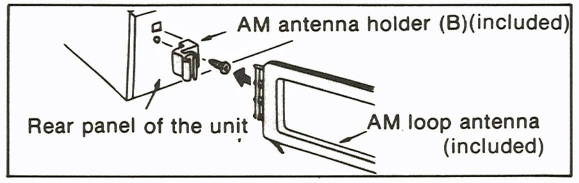
■ Installation of the AM loop antenna

Pay attention to the following points when attaching the antenna.
1) Do not attach it horizontally (to do so would impair reception).
2) Do not attach it close to metal surfaces (to do so would result in noise).
3) Do not attach it close to power cords, speaker wires, etc. (to do so would result in noise).
4) Do not attach it close to a tape deck (when the tape deck is being used, chirping or beeping sounds may be received).

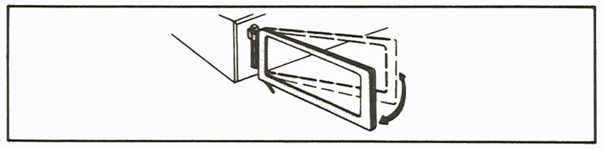
1. Connect the AM loop antenna to the AM antenna terminals located on the rear panel of the unit.
2. Find the height and direction of the antenna where reception is best and then fix it vertically to the wall, rack, etc.
   1) When attaching the antenna to a wall, cloumn or rack.


AM loop antenna (included)
Column
AM antenna holder (A) (included)
AM antenna holder (A) (included)

   2) When attaching the antenna to the unit.
   This type of installation may cause impaired reception or result in signal noise. If possible, attach the antenna to the rack, a wall, or a column.



3. Move the antenna toward the right or left to find the point of best reception.



■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

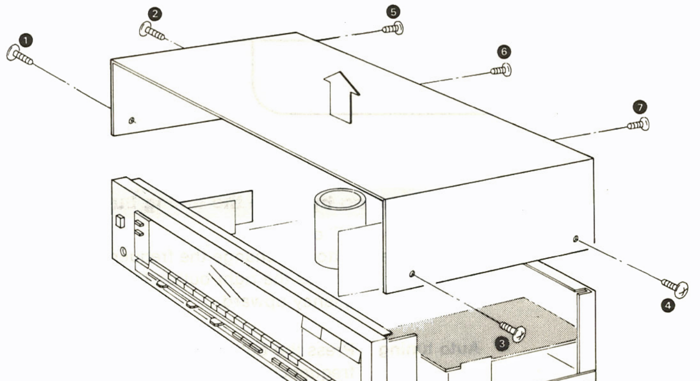
Note

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

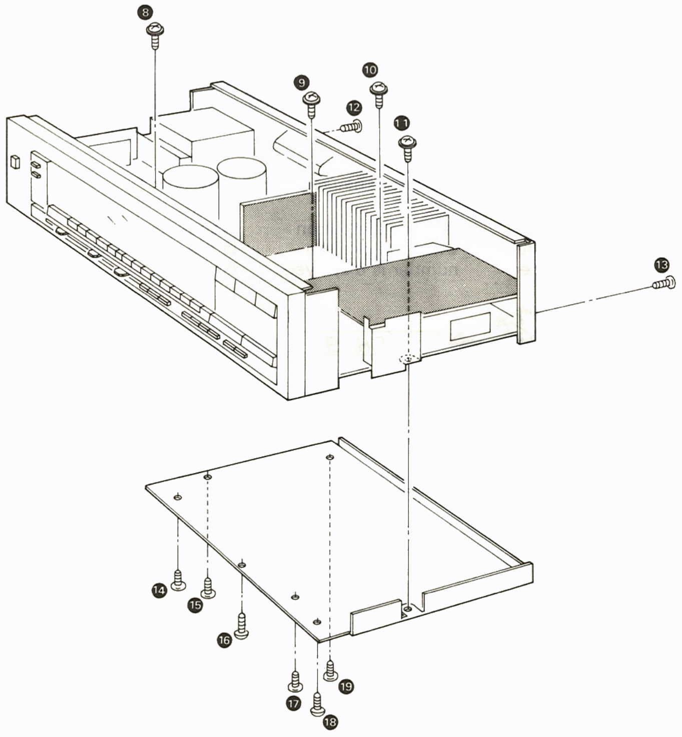
■ DISASSEMBLY INSTRUCTIONS

● How to remove the cabinet

1. Remove the 4 setscrews (Fig. 1 : ① ~ ④) on the right and left sides of the cabinet, and the 3 setscrews (Fig. 1 : ⑤ ~ ⑦) on the back.
2. Remove the cabinet by lifting it in the direction of the arrow.



[Fig. 1]



[Fig. 2]

■ BEFORE REPAIR AND ADJUSTMENT

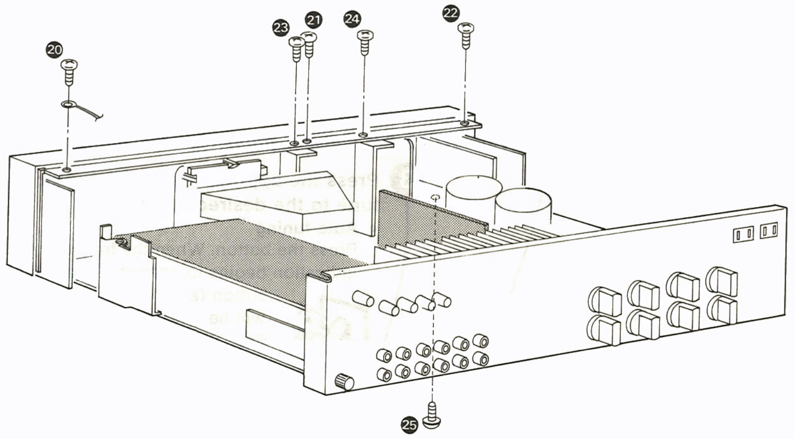
1. Turn off the power supply and short-circuit both ends of the power supply capacitors (C808, C809 56V 8200μF) with a resistor (about 10Ω, 5W) to discharge the charged voltage.
   Do not short both ends of C808 and C809 with a screwdriver. It may damage the component.
2. Before turning on the power supply after completion of repair, slowly apply the primary voltage by using a power supply voltage controller to make sure that the consumed current at 120V, 60Hz in no-signal mode is 150 ~ 500 mA.

● How to remove the bottom board

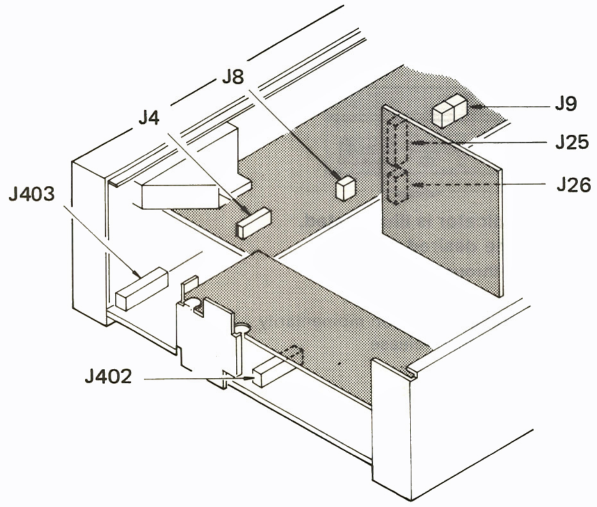
1. Remove the cabinet. (Refer to "**How to remove the cabinet**".)
2. Remove the 3 setscrews (Fig. 2 : ⑧ ~ ⑩) of the main P.C.B.
3. Remove the setscrew (Fig. 2 : ⑪) of the tuner P.C.B. fixture.
4. Remove the 2 setscrews (Fig. 2 : ⑫, ⑬) of the bottom board, arrow-marked (➡) on the rear panel.
5. Remove the 6 setscrews (Fig. 2 : ⑭ ~ ⑲) of the bottom board.

● How to remove the front panel

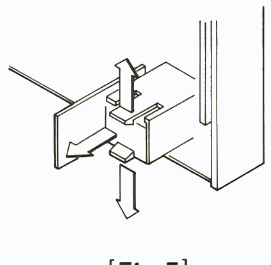
1. Remove the cabinet and bottom board. (Refer to "**How to remove the cabinet and bottom board**".)
2. Remove the 3 setscrews (Fig. 3 : ⑳ ~ ㉒) of the front panel top and the 2 setscrews (Fig. 3 : ㉓, ㉔) of the FL clamp.
3. Remove the setscrew (Fig. 3 : ㉕) of the front panel bottom.
4. Remove the 6 connectors (Fig. 4 : J8, J9, J25, J26, J402, J403.)
5. Release the claws as shown from inside the front panel to remove headphone jack. (Fig. 5) and then remove the front panel.



[Fig. 3]



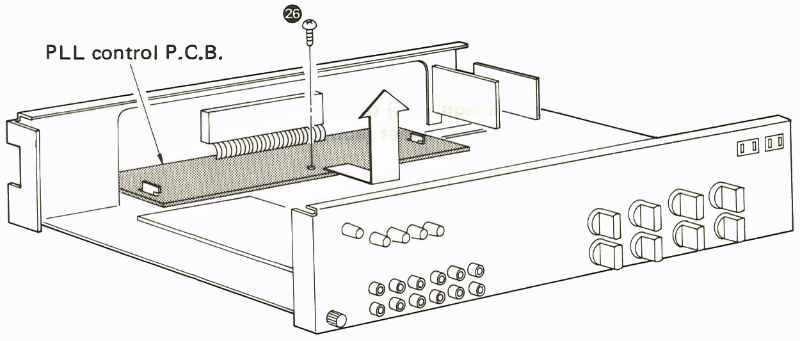
[Fig. 4]



[Fig. 5]

● How to remove the PLL control P.C.B.

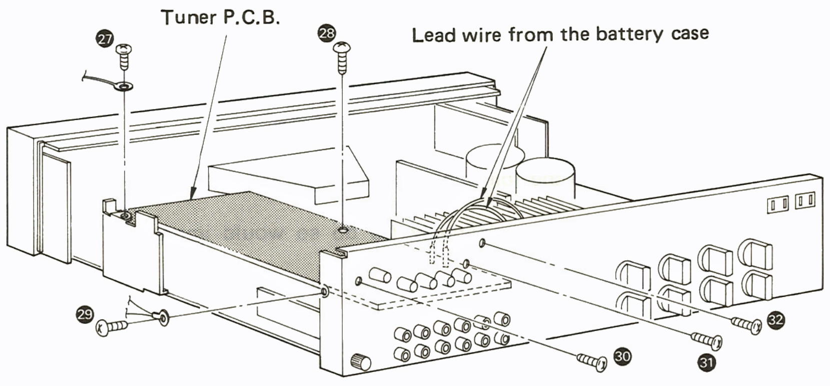
1. Remove the cabinet and front panel. (Refer to "**How to remove the cabinet and front panel**".)
2. Remove the setscrew (Fig. 6 : ㉖) of PLL control of P.C.B.
3. Remove the PLL control P.C.B. from the chassis in the direction of the arrow as shown.



[Fig. 6]

● How to remove the tuner P.C.B.

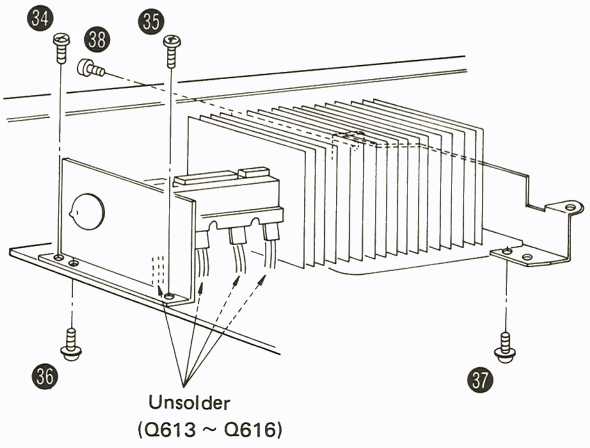
1. Remove the cabinet. (Refer to "**How to remove the cabinet**".)
2. Remove the 2 setscrews (Fig. 7 : ㉗, ㉘) of P.C.B. and the earth lug setscrew (Fig. 7 : ㉙).
3. Remove the 3 setscrews (Fig. 7 : ㉚ ~ ㉜) of antenna terminal plate from the rear panel.
4. Draw the 2 lead wire from the battery case out of the space between the heat-sink and rear panel, and remove the tuner P.C.B. (Fig. 7)



[Fig. 7]

How to remove the heat-sink

1. Remove the cabinet and bottom board. (Refer to "**How to remove the cabinet and bottom board**".)
2. Remove the tuner P.C.B. (Refer to "**How to remove the tuer P.C.B.**".)
3. Remove the 2 setscrews (Fig. 8 : ㉞, ㉟) at the top and 2 setscrews (Fig. 8 : ㊱, ㊲) at the bottom of heat-sink fixture, and the setscrews (Fig. 8 : ㊳) of rear panel, respectively from top, bottom and rear.
4. Unsolder the power transistors (**Q613 ~ Q616**) from under the P.C.B. and then remove the heat-sink.
5. When installing the power transistor, apply heat diffusing agent (silicon powder, etc.) to both sides of the mica plate, and secure it on the heat-sink with setscrews. Next, secure the heat-sink on the chassis and then solder the power transistor.



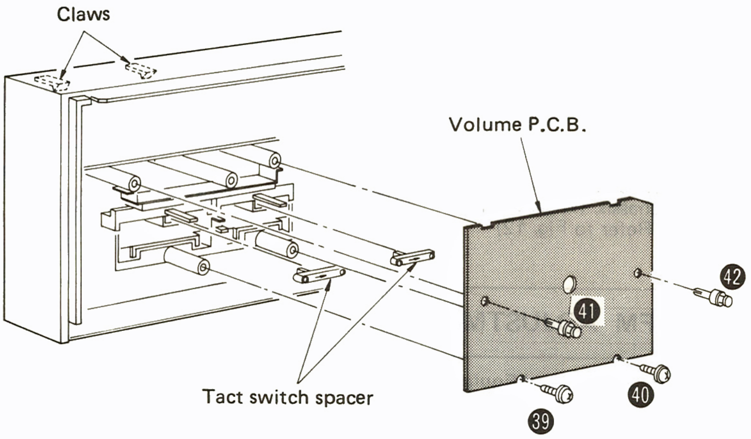
[**Fig. 8**]

How to remove the volume P.C.B.

1. Remove the front panel. (Refer to "**How to remove the front panel**".)
2. Remove the 2 setscrews (Fig. 9 : ㊴, ㊵) and the 2 latches (Fig. 9 : ㊶, ㊷) of volume P.C.B.
3. Release the 2 claws to remove the volume P.C.B. (Fig. 9)

Note

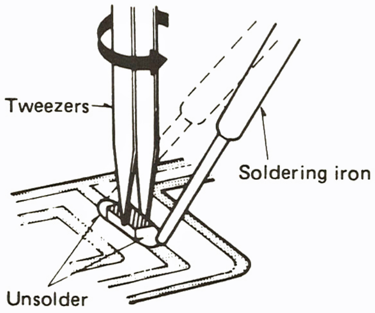
When mounting the volume P.C.B. make sure that the tact switch spacer is in the switch button. Be sure to set it so that the arrow mark (➡) on the tact switch spacer is positioned as illustrated.



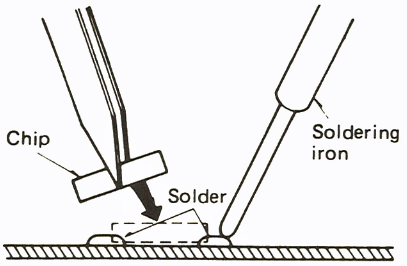
[**Fig. 9**]

■ HOW TO REPLACE CHIPS (RESISTORS)

1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 10.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig.11.



[**Fig. 10**]



[**Fig. 11**]

Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

■ MEASUREMENTS AND ADJUSTMENTS

Note: AM IFT (T204) and AM OSC coil (L201) have been already adjusted, and require no adjustment.

AM ADJUSTMENT

*** Setting and Equipment used**

1. AC electronic voltmeter (VTVM).
2. AM signal generator (AM-SG).
3. Set Band selector to "AM" position.
4. Maintain line voltage at 120 volts.
5. Set speaker selector to "main: on" position.
6. Output of signal generator should be no higher than necessary to obtain an output reading.
7. Use a non-metal screwdriver for the adjustment.

Step No.	AM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
	AM-IF ADJUSTMENT					
1	Connect AM-SG to AM antenna terminal through 200 pF capacitor. Common to chassis. (Powerful input) (Refer to Fig. 12)	450 kHz (30% Mod. with 400 Hz)	Frequency of non-interference	Connect AC VTVM or scope to "speaker" terminals.	T203 (AM IFT)	* Adjust the input frequency and adjustment points so that the output becomes maximum.
	AM-RF ADJUSTMENT					
2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input) (Refer to Fig. 12)	610 kHz (30% Mod. with 400 Hz)	610 kHz	Connect AC VTVM or scope to "speaker" terminals.	L202 (ANT Coil)	1. Adjust for maximum output. 2. Adjust core of L202 by screwdriver.
3		1500 kHz (30% Mod. with 400 Hz)	1500 kHz	Connect AC VTVM or scope to "speaker" terminals.	CT201 (ANT Trimmer)	1. Adjust for maximum output 2. Repeat steps (2) and (3) until the frequency correctly matches the frequency display.

FM ADJUSTMENT

*** Setting and Equipment used**

1. FM signal generator (FM-SG).
2. Distortion analyser.
3. Oscilloscope.
4. DC electronic voltmeter (VTVM).
5. Frequency counter (19 kHz and 108 MHz measurable).
6. Set band selector to "FM" position.
7. Set FM muting/FM mode selector to off/FM mono" position.
8. Other setting are the same as in AM adjustment.
9. Stereo modulator.

*** Preparation of FM signal generator (FM-SG)**

1. Connect stereo modulator to FM-SG.
2. Apply SG output to antenna terminal of the set.
3. The standard input of the set is 60 dB (1 mV), 400 Hz, 100% modulation (Because of attenuation, using coaxial cables. SG output must be 6 dB plus. That is, when input 60 dB, SG output is to be 66 dB.)

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
	FM MONO DISTORTION ADJUSTMENT					
4	Connect FM-SG to FM antenna terminal referring to Fig. 13. (Apply 60 dB to antenna terminal)	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	Connect DC VTVM to between **TP202** and **TP203** through choke coil. (Refer to Fig. 13)	T201 (Discri. IFT)	1. Adjust T201 core so that voltage measured in signal mode is 0 mV (±50mV) in 300mV range. 2. Adjust T202 core so that distortion of right and left channels are minimized.
5		100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	Connect distortion analyser to "speaker" terminal of the set.	T202 (Discri. IFT)	

FM MPX V.C.O. ADJUSTMENT

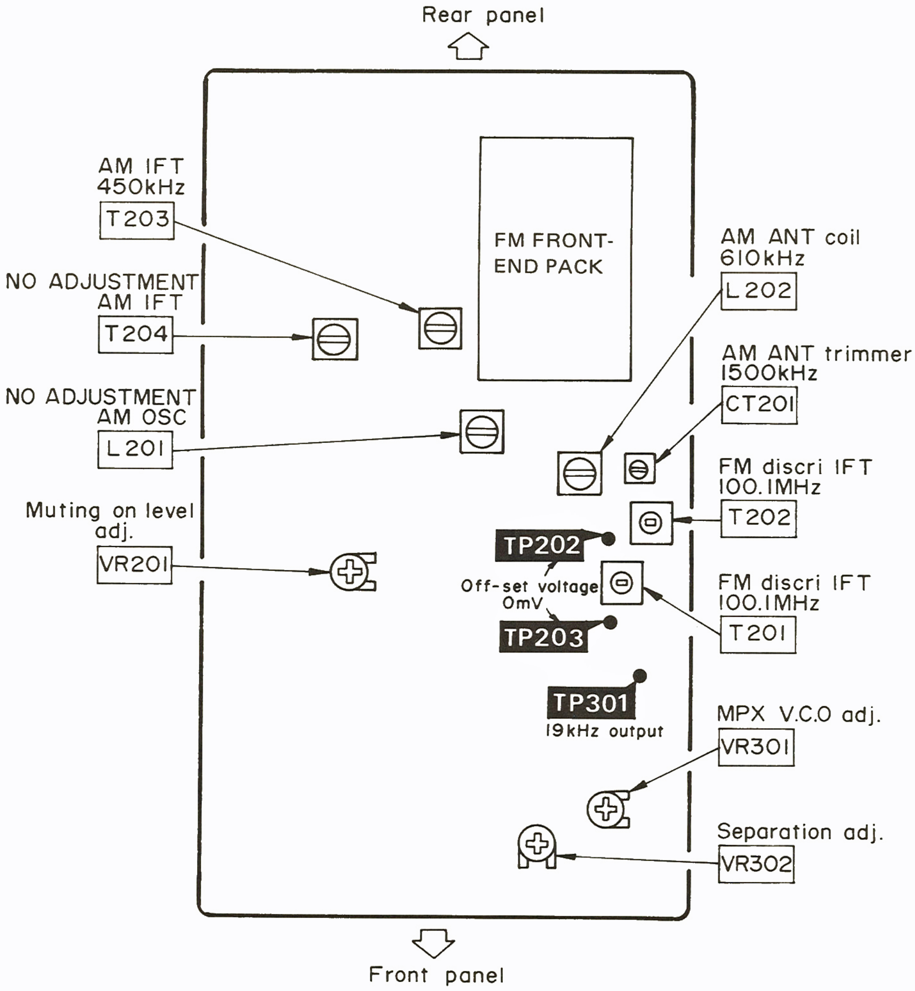
Step No.	USING A FREQUENCY COUNTER	USING ALTERNATE SYSTEM
6	1. 100 MHz, 60 dB Non-modulated mono signal applied to set. 2. Set FM muting/FM mode selector to "on/FM auto" position. 3. Connect frequency counter to **TP301** through resistor (100kΩ) referring to Fig. 14. 4. Adjust **VR301** to 19 kHz ± 30 Hz.	1. Apply stereo signal from generator or stereo station to tuner. 2. Adjust **VR301** until stereo indicator lights up. Cement arm of **VR301** as shown in Fig. 15.

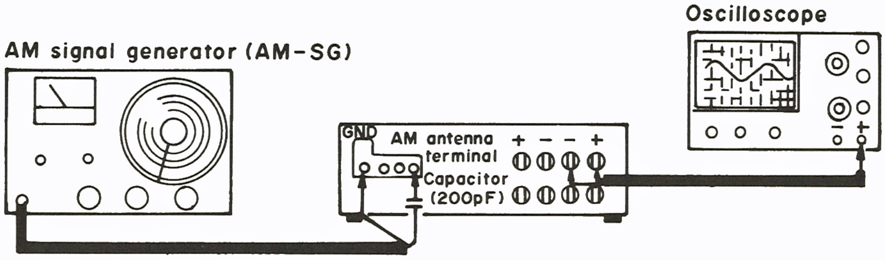
MUTING ON LEVEL ADJUSTMENT

7	Connect FM-SG to FM antenna terminal referring to Fig. 16. (Apply 16 dB to antenna terminal.)	100.1 MHz (100% Mod. with 1 kHz)	100.1 MHz	Connect Oscilloscope to "speaker" terminals.	VR201 (Muting on level)	1. Set FM muting/FM mode selector to "on/FM auto" position. 2. Adjust VR201 so that signal output is delivered. (Check to see that delivery of output is discontinued with input level lowered by 1 ~ 2 dB.)

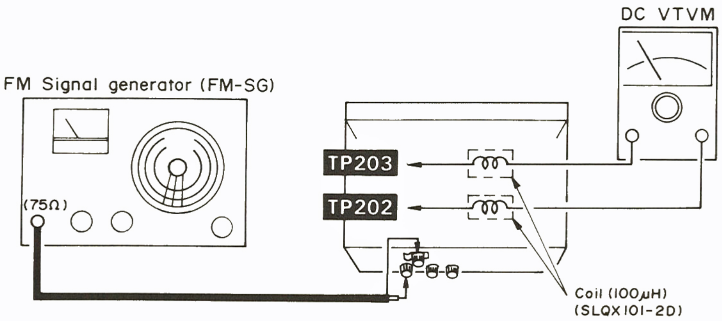
Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	SEPARATION ADJUSTMENT					
8	Connect FM-SG to FM antenna terminal. (Apply 60 dB to antenna terminal.) (Pilot 10% Mod. stereo signal.)	100.1 MHz (100% Mod. with 1 kHz) (L mode)	100.1 MHz	Connect AC VTVM to "Speaker" terminals of the set.	VR302 (Separation)	1. Set FM muting/FM mode selector to "on/FM auto" position. 2. Adjust VR302 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.
	FM ANALOG FREQUENCY METER ADJUSTMENT					
9	——	No-Signal	107.9 MHz	——	VR901 (Frequency meter)	1. Adjust VR901 so that the analog frequency meter indicates 107.9 MHz. (Refer to Fig. 17) 2. Next operate the tuning button so that 88.1 MHz and 96.1 MHz are indicated in the digital frequency display. Then make sure that the indicator is in contact with each letter. 3. If the requirement in step 2 is not satisfied, go back to step 1 and adjust the indicator within the dotted line of Fig. 17.

- **Adjustment points**

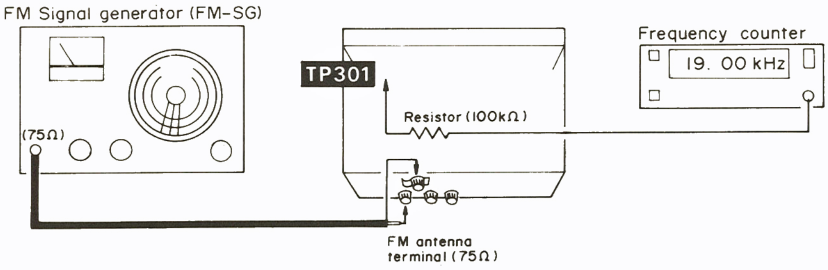

Rear panel
FM FRONT-END PACK
AM IFT 450kHz
T203
NO ADJUSTMENT AM IFT
T204
NO ADJUSTMENT AM OSC
L201
Muting on level adj.
VR201
AM ANT coil 610kHz
L202
AM ANT trimmer 1500kHz
CT201
FM discri IFT 100.1MHz
T202
TP202
Off-set voltage 0mV
TP203
FM discri IFT 100.1MHz
T201
TP301
19kHz output
MPX V.C.O adj.
VR301
Separation adj.
VR302
Front panel


Oscilloscope
AM signal generator (AM-SG)
GND
AM antenna terminal
+ − − +
Capacitor (200pF)

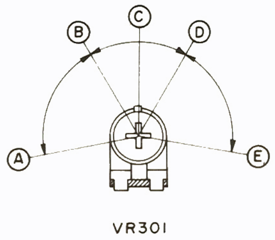
[Fig. 12] (Adjustment of AM)


DC VTVM
FM Signal generator (FM-SG)
(75Ω)
TP203
TP202
Coil (100μH) (SLQX101-2D)

[Fig. 13] (Adjustment of FM offset)

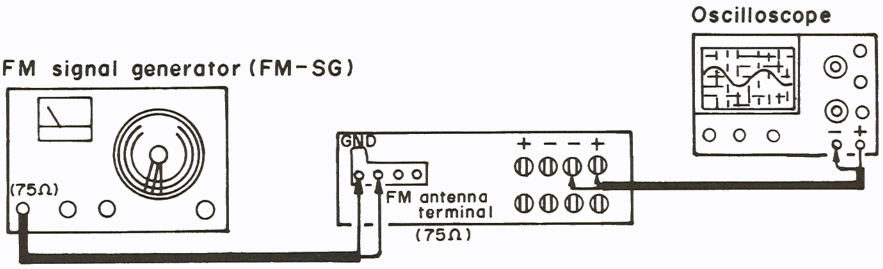

FM Signal generator (FM-SG)
(75Ω)
TP301
Frequency counter
19. 00 kHz
Resistor (100kΩ)
FM antenna terminal (75Ω)

[Fig. 14] (Adjustment of FM MPX VCO)

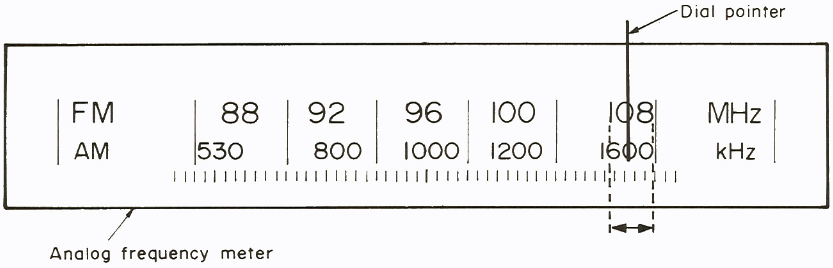


Ⓐ−Ⓑ, Ⓓ−Ⓔ : Stereo OFF position.
Ⓑ−Ⓓ : Stereo ON position. (indicator lighting)
Ⓒ : Adjust point of pilot circuit

[Fig. 15] (Adjustment of FM MPX VCO)


Oscilloscope
FM signal generator (FM-SG)
(75Ω)
GND
+ − − +
FM antenna terminal (75Ω)

[Fig. 16] (Adjustment of muting on level)


Dial pointer
FM
88
92
96
100
108
MHz
AM
530
800
1000
1200
1600
kHz
Analog frequency meter

[Fig. 17] (Adjustment of FM analog frequency meter)

AMPLIFIER ADJUSTMENT

1. Adjustment of Load Impedance Detection Circuit (after reparing the speaker impedance detection circuit.) [Refer to Fig. 18]

1. Set the main speaker switch to "on" and the remote speaker switch to "off", then make the volume level minimum.
2. Connect a load with 6.5Ω (1/2W, carbon resistor) or series connected 3.3Ω and 3.3Ω (1/2W, carbon resistor) to the "Main: Lch and R ch" speaker terminal.
3. Connect TP803 and ground (chassis) with lead wire.
4. Connect a DC voltmeter between TP801 and ground (chassis) [L channel] or TP802 and ground (chassis) [R channel].
5. Adjust VR802 (L channel) so that the voltage of TP801 is 0 mV (–200 mV ~ 50 mV).
6. Adjust VR801 (R channel) so that the voltage of TP802 is 0 mV (–200 mV ~ 50 mV).
7. Remove the lead wire which connects TP803 and ground.

Checks

1. Set both main speaker switch and remote speaker selector to "off".
2. Connect a lead with 6.3Ω (1/2W, carbon resistor) or series connected 3.3Ω and 2.7Ω (1/2W, carbon resistor) to the "Remote-L•R channel" speaker terminal.
3. Check that tap selector relay (RLY802) becomes "low tap" when remote speaker switch is set to "on.
   * "Low tap" is a state of tap with tap selector relay (RLY802) turned "on".

2. Checks of Protection Circuit After Repair and Adjustment.

- **Check of Overload Detection and Protection Circuit [Overload Detection circuit]**

1. Connect 4Ω (resistor or speaker) to main speaker terminal (L channel).
2. Main speaker switch is "on" position.
3. Apply output signal of about 5V at 1 kHz to Aux input terminal.
4. Make sure that no output is delivered when short-circuited with 5W, 0.33Ω resistor.
5. When power switch is turned "on" after turning it "off", then output should be delivered.
6. Similary check the R channel.

- **[DC Detection circuit]**

1. Main sepaker switch is "on" position.
2. Apply ±15V DC to main speaker terminal. Then make sure that RLY801 turns off.
3. Set the main speaker switch to "off", and remote speaker switch to "on".
4. Connect 4Ω (Speaker) to remote speaker terminal (L channel).
5. Apply 5 Hz 300 mV signal to aux input terminal and volume level set at minimum, make sure that output is delivered.

3. Idling (ICQ) Adjustment (after repairing the main amp.)

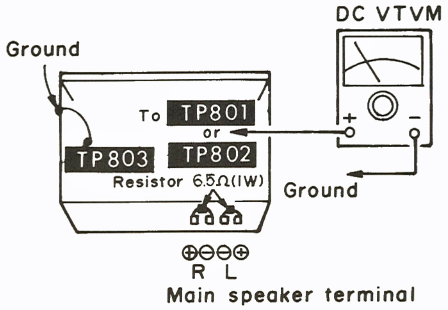
1. After the repair, set the volume level to minimum before turning on the power switch, and connect nothing to the speaker terminal.
2. Completely turn ICQ control (VR601, 602) counter-clockwise.
3. Connect the DC electronic voltmeter to TP1 (+) and TP2 (–) [L channel] or TP3 (+) and TP4 (–) [R channel]. [Refer to Fig. 19]
4. Make the adjustment as shown below 3 min. after turning power switch "on".

——	TEST POINT	PARTS ADJUSTED	VALUE	——	TEST POINT	PARTS ADJUSTED	VALUE
L channel	TP1 – TP2 (Z601)	VR601	25~30 mV	R channel	TP3 – TP4 (Z602)	VR602	25~30 mV

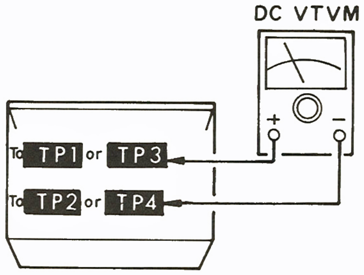
Note 1. Computer drive monitor indicator should indicate "auto".
2. Tap selector relay (RLY802) should be "high tap".
* "High tap" is a state of tap with tap selector relay (RLY802) turned "off".

4. Clock Adjustment (after replacing the microcomputer)

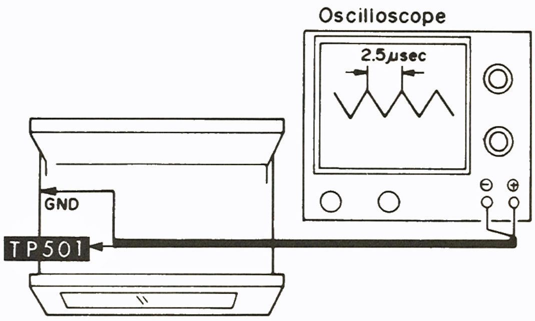
1. Connect the osilloscope to **TP501** .
2. Adjust VR501 so that period of waveform is 2.5μsec. (Refer to Fig. 20).


Ground
DC VTVM
To TP801
or
TP803
TP802
Resistor 6.5Ω(1W)
Ground
R L
Main speaker terminal

[Fig. 18]

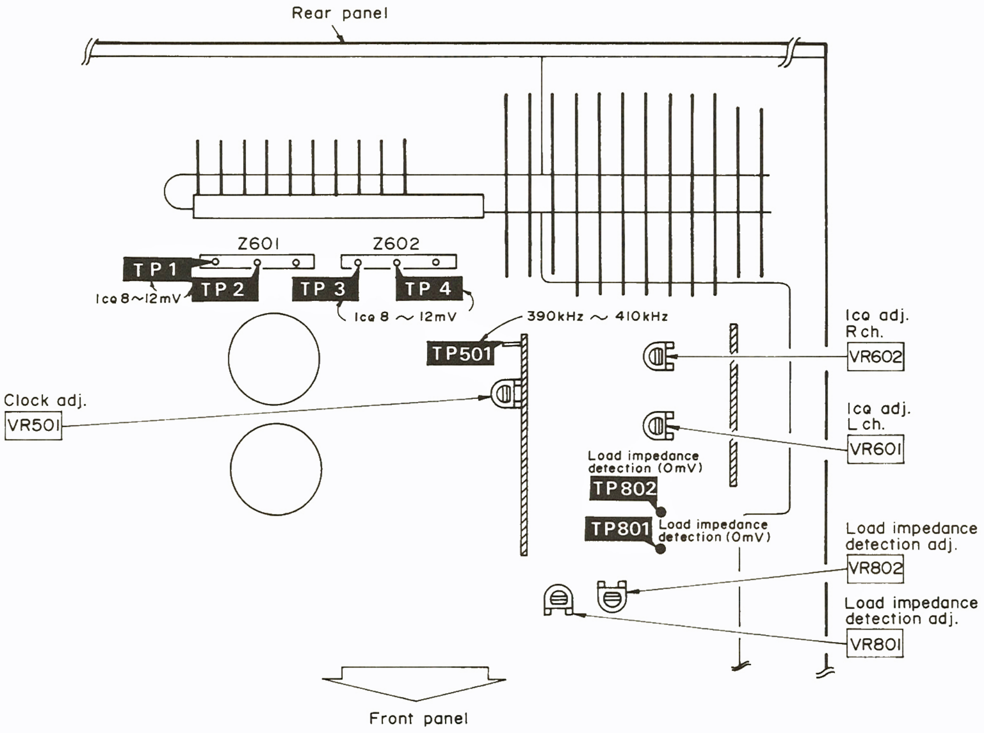

DC VTVM
To TP1 or TP3
To TP2 or TP4

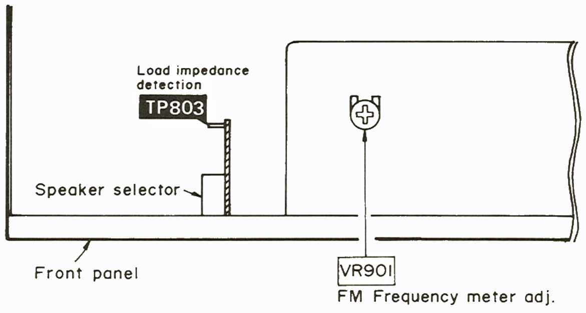
[Fig. 19]


Oscilloscope
2.5μsec
GND
TP501

[Fig. 20]

• Adjustment points


Rear panel
Z601
Z602
TP1
TP2
TP3
TP4
Icq 8～12mV
Icq 8 ～ 12mV
390kHz ～ 410kHz
TP501
Clock adj.
VR501
Icq adj.
R ch.
VR602
Icq adj.
L ch.
VR601
Load impedance detection (0mV)
TP802
TP801
Load impedance detection (0mV)
Load impedance detection adj.
VR802
Load impedance detection adj.
VR801
Front panel


Load impedance detection
TP803
Speaker selector
Front panel
VR901
FM Frequency meter adj.

■ RESISTORS & CAPACITORS

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The "Ⓢ" mark is service standard parts and may differ from production parts.
4. The unit of resistance is Ω(ohm), K = 1000Ω, M = 1000kΩ.
5. The unit of capacitance is μF (microfarad). P = 10^{-6} μF
6. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value
ERG	2	AN	J	2R2
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W	J : ± 5%
ERG : Metal Oxide	12 : 1/2W	K : ± 10%
ERC : Solid	25 : 1/4W	
ERO : Metal film	1 : 1W	
	2 : 2W	
	S1 : 1/2W	

ERD10TLJ☐☐☐ → Chip type carbon
ERO10MKG☐☐☐ → Chip type metal film

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M	R47	R
Type	Voltage	Peculiarity	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Order	
ECEA : Electrolytic	OJ : 6.3V	1H : 50V	C : ± 0.25pF
ECCD : Ceramic	1A : 10V	1C : 16V	J : ± 5%
ECKD : Ceramic	1C : 16V	KC : 400V AC	K : ± 10%
ECQM : Polyester	1E : 25V	1 : 100V	Z : +80%, −20%
ECQP : Polypropylene	1H : 50V		N : ± 30%
ECET : Electrolytic	1V : 35V		P : +100%, −0%
ECEA..... N: Non Polar Electrolytic	50 : 50V		
ECBT : Axial Leaded Type Ceramic	25 : 25V		
	2A : 100V		
	1J : 63V		

Ref. No.	Part No.	Value
RESISTORS		
R1,2	ERD10TLJ391U	390
R3,4	ERD10TLJ224U	220K
R5,6	ER010MKG5622	56.2K
R7,8	ERD10TLJ271U	270
R9,10	ERD10TLJ680U	68
R11,12	ERD10TLJ184U	180K
R13,14	ERD10TLJ123U	12K
R15,16	ERD10TLJ563U	56K
R17,18	ERD10TLJ102U	1K
R71,72	ERD10TLJ334U	330K
R73,74	ERD10TLJ102U	1K
R75,76	ERD10TLJ124U	120K
R77,78	ERD10TLJ103U	10K
R79,80	ERD10TLJ220U	22
R202 Ⓢ	ERD25FJ331	330
R203 Ⓢ	ERD25FJ561	560
R204 Ⓢ	ERD25FJ331	330
R205 Ⓢ	ERD25TJ824	820K
R206 Ⓢ	ERD25TJ273	27K
R207 Ⓢ	ERD25TJ153	15K
R208 Ⓢ	ERD25FJ103	10K
R209 Ⓢ	ERD25FJ182	1.8K
R210 Ⓢ	ERD25FJ682	6.8K
R211 Ⓢ	ERD25FJ181	180
R212 Ⓢ	ERD25TJ683	68K
R213 Ⓢ	ERD25TJ473	47K
R215 Ⓢ	ERD25FJ562	5.6K
R216 Ⓢ	ERD25FJ103	10K
R217 Ⓢ	ERD25FJ391	390
R218 Ⓢ	ERD25FJ272	2.7K
R219 Ⓢ	ERD25TJ123	12K
R220 Ⓢ	ERD25TJ223	22K
R221 Ⓢ	ERD25FJ821	820
R222 Ⓢ	ERD25TJ333	33K
R223 Ⓢ	ERD25TJ473	47K
R224 Ⓢ	ERD25FJ103	10K
R225 Ⓢ	ERD25TJ473	47K
R226 Ⓢ	ERD25FJ561	560
R227 Ⓢ	ERD25FJ821	820
R228 Ⓢ	ERD25FJ391	390
R229 Ⓢ	ERD25FJ181	180
R230 Ⓢ	ERD25FJ562	5.6K
R231 Ⓢ	ERD25FJ102	1K

Ref. No.	Part No.	Value
RESISTORS		
R232 Ⓢ	ERD25TJ104	100K
R233 Ⓢ	ERD25FJ821	820
R234 Ⓢ	ERD25TJ333	33K
R235 Ⓢ	ERD25FJ103	10K
R236 Ⓢ	ERD25TJ223	22K
R237 Ⓢ	ERD25FJ822	8.2K
R238 Ⓢ	ERD25FJ102	1K
R239 Ⓢ	ERD25TJ104	100K
R240 Ⓢ	ERD25TJ473	47K
R241 Ⓢ	ERD25FJ103	10K
R242 Ⓢ	ERD25TJ273	27K
R243 Ⓢ	ERD25TJ473	47K
R244 Ⓢ	ERD25TJ563	56K
R245 Ⓢ	ERD25FJ103	10K
R246 Ⓢ	ERD25TJ333	33K
R247 Ⓢ	ERD25FJ472	4.7K
R248 Ⓢ	ERD25FJ391	390
R249 Ⓢ	ERD25FJ472	4.7K
R250 Ⓢ	ERD25FJ221	220
R290 ⚠	ERDS1FJ823	82K
R291 Ⓢ	ERD25TJ683	68K
R301 Ⓢ	ERD25FJ151	150
R302,303 Ⓢ	ERD25TJ223	22K
R304 Ⓢ	ERD25TJ153	15K
R305 Ⓢ	ERD25FJ102	1K
R306,307 Ⓢ	ERD25FJ392	3.9K
R308,309 Ⓢ	ERD25TJ104	100K
R310,311 Ⓢ	ERD25TJ104	100K
R312 Ⓢ	ERD25FJ103	10K
R313,314 Ⓢ	ERD25TJ104	100K
R315 Ⓢ	ERD25FJ222	2.2K
R401,402 Ⓢ	ERD25FJ561	560
R403,404 Ⓢ	ERD25TJ224	220K
R405,406 Ⓢ	ERD25TJ224	220K
R407,408 Ⓢ	ERD25TJ124	120K
R409,410 Ⓢ	ERD25TJ153	15K
R411,412 Ⓢ	ERD25FJ152	1.5K
R415,416 Ⓢ	ERD25FJ103	10K
R417 Ⓢ	ERD25FJ332	3.3K
R418,419 Ⓢ	ERD25TJ153	15K
R420,421 Ⓢ	ERD25TJ153	15K
R422,423 Ⓢ	ERD25TJ153	15K
R424 Ⓢ	ERD25FJ471	470

Ref. No.	Part No.	Value
RESISTORS		
R425,426 Ⓢ	ERD25FJ561	560
R427 Ⓢ	ERD25TJ394	390K
R428 Ⓢ	ERD25TJ334	330K
R429 Ⓢ	ERD25FJ181	180
R430 Ⓢ	ERD25FJ103	10K
R431,432 Ⓢ	ERD25FJ562	5.6K
R433,434 Ⓢ	ERD25FJ562	5.6K
R435,436 Ⓢ	ERD25FJ102	1K
R437 Ⓢ	ERD25TJ224	220K
R438 Ⓢ	ERD25FJ103	10K
R440 Ⓢ	ERD25FJ561	560
R441 Ⓢ	ERD25TJ393	39K
R442 Ⓢ	ERD25FJ561	560
R443 Ⓢ	ERG1ANJ271	270
R444,445 Ⓢ	ERD25TJ224	220K
R446,447 Ⓢ	ERD25FJ101	100
R448 Ⓢ	ERD25FJ222	2.2K
R450,451 Ⓢ	ERD25TJ153	15K
R452 Ⓢ	ERD25TJ153	15K
R461,462 Ⓢ	ERD25FJ331	330
R470,471〔MC〕 only ⚠	ERD25FJ100	10
R498,499 Ⓢ	ERD25FJ681	680
R501,502 Ⓢ	ERD25FJ331	330
R503,504 Ⓢ	ERD25FJ272	2.7K
R505,506 Ⓢ	ERD25TJ154	150K
R507,508 Ⓢ	ERD25TJ223	22K
R509,510 Ⓢ	ERD25TJ333	33K
R511,512 Ⓢ	ERD25TJ183	18K
R513,514 Ⓢ	ERD25TJ123	12K
R517,518 Ⓢ	ERD25FJ103	10K
R519 Ⓢ	ERD25FJ103	10K
R524 Ⓢ	ERD25FJ153	15K
R525 Ⓢ	ERD25FJ153	15K
R526 Ⓢ	ERD25TJ223	22K
R527 Ⓢ	ERD25TJ183	18K
R528 Ⓢ	ERD25TJ223	22K
R529 Ⓢ	ERD25TJ183	18K
R536 Ⓢ	ERD25FJ472	4.7K
R540 Ⓢ	ERD25FJ472	4.7K
R543 Ⓢ	ERD25FJ222	2.2K

Ref. No.	Part No.	Value
RESISTORS		
R545 Ⓢ	ERD25TJ473	47K
R546 Ⓢ	ERD25FJ562	5.6K
R547 Ⓢ	ERD25FJ103	10K
R551 Ⓢ	ERD25FJ271	270
R552 ⚠	ERDS1FJ122	1.2K
R553 Ⓢ	ERD25TJ223	22K
R554 Ⓢ	ERD25FJ681	680
R555 Ⓢ	ERD25FJ562	5.6K
R556 Ⓢ	ERD25FJ560	56
R557 Ⓢ	ERD25FJ181	180
R558,559 Ⓢ	ERD25FJ151	150
R560,561 Ⓢ	ERD25FJ271	270
R562 Ⓢ	ERD25FJ271	270
R563 Ⓢ	ERD25FJ561	560
R564 Ⓢ	ERD25FJ820	82
R601,602 Ⓢ	ERD25TJ824	820K
R603,604 Ⓢ	ERD25TJ824	820K
R605,606 Ⓢ	ERD25TJ474	470K
R607,608 Ⓢ	ERD25TJ474	470K
R609,610 Ⓢ	ERD25FJ392	3.9K
R611,612 Ⓢ	ERD25FJ102	1K
R613,614 Ⓢ	ERD25TJ223	22K
R615,616 Ⓢ	ERD25FJ332	3.3K
R617,618 Ⓢ	ERD25TJ393	39K
R619,620 Ⓢ	ERD25TJ474	470K
R621,622 Ⓢ	ERD25FJ102	1K
R623,624 Ⓢ	ERD25FJ103	10K
R625,626 Ⓢ	ERD25FJ471	470
R627,628 ⚠	ERDS1FJ6R8	6.8
R629,630 ⚠	ERDS1FJ332	3.3K
R631,632 ⚠	ERDS1FJ821	820
R633,634 ⚠	ERDS1FJ470	47
R635,636 ⚠	ERDS1FJ182	1.8K
R637,638 Ⓢ	ERD25TJ223	22K
R639,640 ⚠	ERDS1FJ331	330
R641,642 ⚠Ⓢ	ERD25TJ184	180K
R643,644 ⚠Ⓢ	ERD25TJ184	180K
R645,646 Ⓢ	ERG1ANJ100	10
R647,648 Ⓢ	ERG1ANJ100	10
R649,650 Ⓢ	ERD25FJ472	4.7K
R651,652 Ⓢ	ER025CKF1203	120K
R653,654 Ⓢ	ERD25FJ822	8.2K
R655,656 Ⓢ	ERD25TJ333	33K
R657,658 Ⓢ	ERG1ANJ331	330

Ref. No.	Part No.	Value
RESISTORS		
R659,660 ⚠	ERDS1FJ681	680
R661,662 ⚠	ERDS1FJ681	680
R663 Ⓢ	ERD25TJ473	47K
R664 ⚠	ERDS1FJ332	3.3K
R665 ⚠Ⓢ	ERD25FJ560	56
R666 ⚠	ERDS1FJ470	47
R667,668 Ⓢ	ERD25FJ681	680
R671,672 Ⓢ	ERD25FJ272	2.7K
R801,802 Ⓢ	ERD25FJ332	3.3K
R803,804 Ⓢ	ERD25FJ470	47
R805,806 Ⓢ	ERD25FJ562	5.6K
R807,808 Ⓢ	ERD25TJ334	330K
R809,810 Ⓢ	ERD25FJ821	820
R811,812 Ⓢ	ERD25TJ824	820K
R813,814 Ⓢ	ERD25FJ682	6.8K
R815,816 Ⓢ	ERD25FJ682	6.8K
R817,818 Ⓢ	ERD25TJ223	22K
R819,820 Ⓢ	ERD25TJ223	22K
R821 Ⓢ	ERD25TJ223	22K
R822 Ⓢ	ERD25TJ823	82K

Ref. No.	Part No.	Value
RESISTORS		
R823,824 Ⓢ	ERD25TJ223	22K
R825 Ⓢ	ERD25TJ333	33K
R826,827 Ⓢ	ERD25TJ823	82K
R828 Ⓢ	ERD25TJ473	47K
R829 Ⓢ	ERD25TJ184	180K
R830〔M〕 Ⓢ	ERD25TJ273	27K
R830〔MC〕	ERD25TJ123	12K
R831 ⚠Ⓢ	ERD25TJ823	82K
R832 Ⓢ	ERD25TJ183	18K
R833 ⚠Ⓢ	ERD25FJ562	5.6K
R834 Ⓢ	ERG1ANJ820	82
R836 Ⓢ	ERD25FJ272	2.7K
R837 Ⓢ	ERD25FJ222	2.2K
R838 Ⓢ	ERD25FJ272	2.7K
R839 Ⓢ	ERD25FJ222	2.2K
R840 Ⓢ	ERD25FJ102	1K
R841 ⚠Ⓢ	ERG2ANJ270	27
R842 ⚠	ERDS1FJ272	2.7K
R843 Ⓢ	ERD25FJ182	1.8K
R844 ⚠	ERDS1FJ221	220

Ref. No.	Part No.	Value
RESISTORS		
R845 ⚠	ERDS1FJ101	100
R846 Ⓢ	ERD25FJ821	820
R847 Ⓢ	ERD25FJ102	1K
R848,849 ⚠	ERDS1FJ220	22
R850 Ⓢ	ERD25FJ272	2.7K
R851 ⚠Ⓢ	ERG1ANJ271	270
R852 ⚠Ⓢ	ERG2ANJ681	680
R853 Ⓢ	ERG2ANJ271	270
R854〔M〕 Ⓢ	ERD25TJ473	47K
R854〔MC〕	ERD25TJ273	27K
R855	ERDS1FJ2R2	2.2
R901 Ⓢ	ERD25FJ102	1K
R902 Ⓢ	ERD25FJ561	560
R903 Ⓢ	ERD25FJ682	6.8K
R904 Ⓢ	ERD25FJ103	10K
R905 Ⓢ	ERD25FJ101	100
R906 Ⓢ	ERD25FJ151	150
R907 Ⓢ	ERD25FJ103	10K
R908 Ⓢ	ERD25TJ273	27K
R909 ⚠	ERDS1FJ680	68

Ref. No.	Part No.	Value
RESISTORS		
R910 Ⓢ	ERD25FJ681	680
R911 Ⓢ	ERD25FJ103	10K
R912 Ⓢ	ERD25TJ224	220K
R913 Ⓢ	ERD25TJ154	150K
R914 Ⓢ	ERD25TJ104	100K
R920 Ⓢ	ERD25TJ824	820K
R921 Ⓢ	ERD25TJ473	47K
R922 Ⓢ	ERD25TJ333	33K
R923 Ⓢ	ERD25FJ151	150
R924 Ⓢ	ERD25TJ104	100K
R925 Ⓢ	ERD25TJ473	47K
R926 Ⓢ	ERD25TJ224	220K
R927 Ⓢ	ERD25FJ221	220
R928 Ⓢ	ERD25TJ223	22K
R929 Ⓢ	ERD25TJ684	680K
R1001 ⚠Ⓢ	ERC12ZGK335	3.3M

Ref. No.	Part No.	Value
CAPACITORS		
C1,2 Ⓢ	ECEA50Z3R3	3.3
C3,4 Ⓢ	ECCD1H101K	100P
C5,6 Ⓢ	ECKD1H471KB	470P
C7,8 Ⓢ	ECQM1H223JZ	0.022
C9,10 Ⓢ	ECQM1H682JZ	0.0068
C11,12 ⚠	ECEA1HN010S	1
C13,14 Ⓢ	ECEA1CS330	33
C71,72 Ⓢ	ECEA50Z3R3	3.3
C73,74 Ⓢ	ECCD1H390K	39P
C75,76 Ⓢ	ECCD1H820K	82P
C77,78 Ⓢ	ECKD1H391KB	390P
C201	ECBT1C103ZYY	0.01
C202,203	ECBT1C223NYY	0.022
C205,206	ECBT1C223NYY	0.022
C207	ECBT1C223NYY	0.022
C208 Ⓢ	ECCD1H101K	100P
C210,211 Ⓢ	ECEA50Z1	1
C212 Ⓢ	ECEA25Z4R7	4.7
C213 Ⓢ	ECEA50Z1	1
C214,215	ECBT1C223NYY	0.022
C216 Ⓢ	ECEA1HS100	10
C217,218	ECBT1C223NYY	0.022
C219	ECBT1C223NYY	0.022
C220 Ⓢ	ECEA50ZR47	0.47
C222	ECBT1H102ZXY	0.001
C223 Ⓢ	ECCD1H150KC	15P
C224 Ⓢ	ECQM1H473JZ	0.047
C225 Ⓢ	ECCD1H120KC	12P
C226	ECQP1471JZ	470P
C228 Ⓢ	ECEA1AS101	100
C229 Ⓢ	ECEA1CS330	33
C230 Ⓢ	ECEA1CS330	33
C231 Ⓢ	ECQM1H183JZ	0.018
C233	ECBT1C223NYY	0.022
C234,235	ECBT1C103ZYY	0.01
C237 Ⓢ	ECKD1H103ZF	0.01
C238 Ⓢ	ECEA50Z2R2	2.2
C298,299 Ⓢ	ECKD1H103ZF	0.01

Ref. No.	Part No.	Value
CAPACITORS		
C301 Ⓢ	ECEA1CS221	220
C302,303 Ⓢ	ECQM1H223JZ	0.022
C304,305 Ⓢ	ECEA50ZR47	0.47
C306	ECQP1471JZ	470P
C307 Ⓢ	ECEA50Z1	1
C309 Ⓢ	ECQM1H473JZ	0.047
C310 Ⓢ	ECEA50ZR47	0.47
C311 Ⓢ	ECEA50Z3R3	3.3
C312 Ⓢ	ECEA50Z1	1
C313	ECBT1C103ZYY	0.01
C401,402 Ⓢ	ECEA25Z4R7	4.7
C405,406 Ⓢ	ECEA1ES470	47
C407,408 Ⓢ	ECCD1H330K	33P
C409,410 Ⓢ	ECQM1H104JZ	0.1
C411,412 Ⓢ	ECEA1HS100	10
C413 Ⓢ	ECEA1HS100	10
C414 Ⓢ	ECEA25Z4R7	4.7
C415 Ⓢ	ECEA1AS470	47
C417 Ⓢ	ECQM1H473JZ	0.047
C418 Ⓢ	ECEA50Z1	1
C419 Ⓢ	ECEA1AS331	330
C421 Ⓢ	ECKD1H473ZF	0.047
C422,423 Ⓢ	ECEA50Z3R3	3.3
C424 Ⓢ	ECKD1H473ZF	0.047
C425 Ⓢ	ECCD1H151K	150P
C426 Ⓢ	ECCD1H151K	150P
C427 Ⓢ	ECKD1H473ZF	0.047
C428 Ⓢ	ECEA25Z4R7	4.7
C429,430 Ⓢ	ECKD1H473ZF	0.047
C501,502 Ⓢ	ECEA50Z1	1
C503,504 Ⓢ	ECEA50Z3R3	3.3
C505 ⚠	ECEA1CN470S	47
C508 Ⓢ	ECCD1H151K	150P
C510 Ⓢ	ECEA50Z3R3	3.3
C511 Ⓢ	ECEA25Z4R7	4.7
C513 Ⓢ	ECEA50Z3R3	3.3
C521 Ⓢ	ECKD1H223ZF	0.022
C522 Ⓢ	ECEA1AS221	220

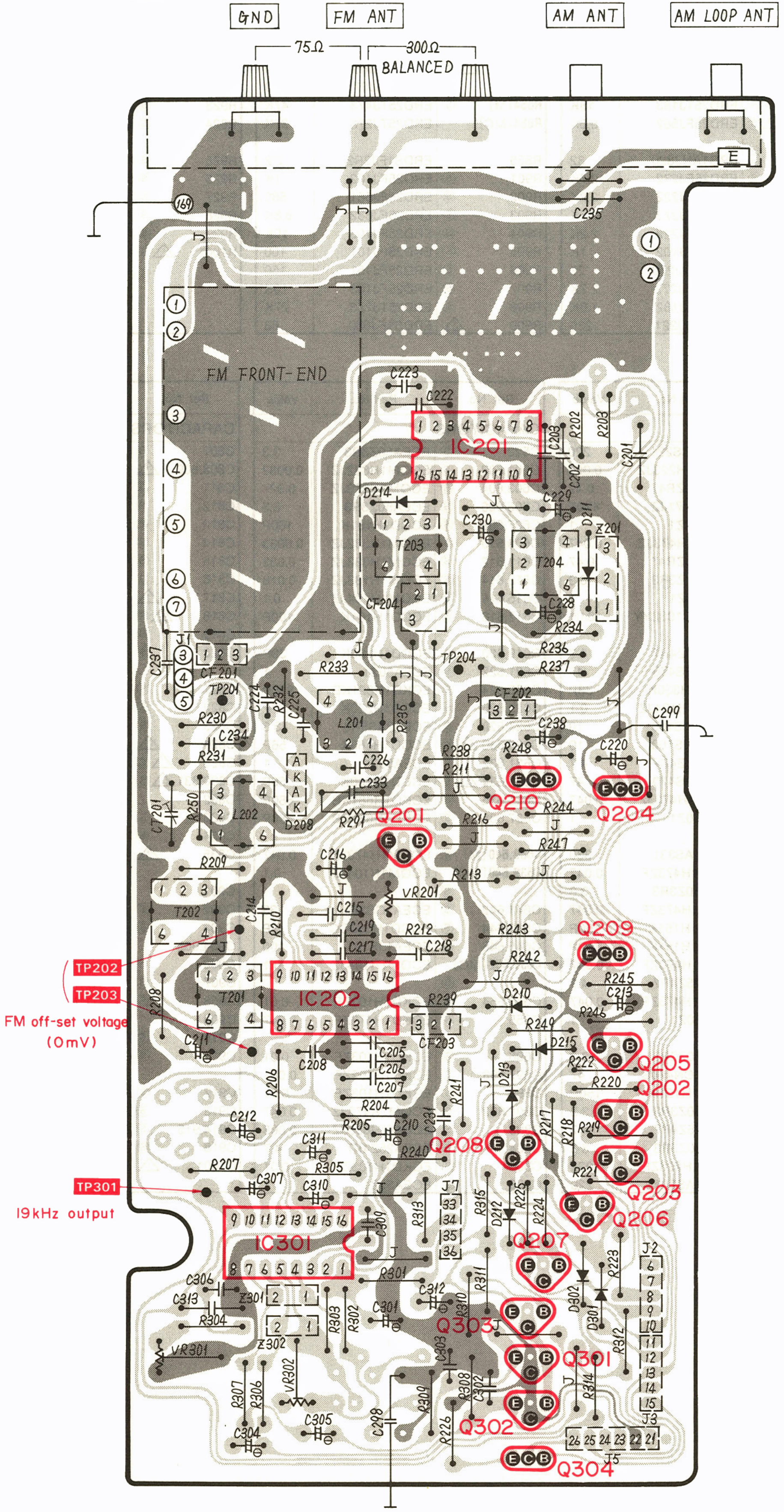
Ref. No.	Part No.	Value
CAPACITORS		
C523 Ⓢ	ECEA50Z3R3	3.3
C601,602 Ⓢ	ECQM1H822JZ	0.0082
C603,604 Ⓢ	ECQM1H273JZ	0.027
C605,606 Ⓢ	ECEA50Z3R3	3.3
C607,608 Ⓢ	ECCD1H101K	100P
C609,610 Ⓢ	ECQM1H332JZ	0.0033
C611,612 Ⓢ	ECQM1H333JZ	0.033
C613,614 Ⓢ	ECQM1H183JZ	0.018
C615,616 Ⓢ	ECQM1H104JZ	0.1
C617,618 Ⓢ	ECCD1H101K	100P
C619,620 Ⓢ	ECCD1H390K	39P
C621,622 Ⓢ	ECEA50Z1	1
C623,624 Ⓢ	ECKD1H821KB	820P
C625,626 Ⓢ	ECCD1H220K	22P
C627,628 Ⓢ	ECEA2AS3R3	3.3
C629,630 ⚠Ⓢ	ECCD1H560K	56P
C631,632 Ⓢ	ECEA50Z1	1
C633,634 ⚠Ⓢ	ECCD1H560K	56P
C635,636 Ⓢ	ECKD1H681KB	680P
C637,638 Ⓢ	ECKD1H681KB	680P
C639,640〔M〕 Ⓢ	ECQM1H473JZ	0.047
C639,640〔MC〕 Ⓢ	ECQM1H104JZ	0.1
C641,642 Ⓢ	ECEA1CS330	33
C643,644 Ⓢ	ECCD1H030CC	3P
C645,646 Ⓢ	ECEA1JS101	100
C651,652〔MC〕 Ⓢ	ECQM1H104JZ	0.1
C653,654 Ⓢ	ECKD1H103ZF	0.01
C655 Ⓢ	ECKD1H473ZF	0.047
C696 Ⓢ	ECKD1H103ZF	0.01
C697,698 Ⓢ	ECKD1H102ZF	0.001
C699 Ⓢ	ECKD1H103ZF	0.01
C801,802 Ⓢ	ECQM1H473JZ	0.047
C803 Ⓢ	ECQM1H683JZ	0.068
C804 Ⓢ	ECEA25Z4R7	4.7
C805 Ⓢ	ECKD1H103ZF	0.01
C806 Ⓢ	ECEA50Z1	1

Ref. No.	Part No.	Value
CAPACITORS		
C807 Ⓢ	ECEA50Z1	1
C808,809 ⚠	ECETS56V822U	8200
C811 Ⓢ	ECEA1AS470	47
C812 Ⓢ	ECKD1H103ZF	0.01
C813 Ⓢ	ECEA1AS470	47
C814 Ⓢ	ECEA1HS470	47
C815 Ⓢ	ECKD1H103ZF	0.01
C816 Ⓢ	ECEA1VS101	100
C817 ⚠	ECEA1HU471	470
C818 ⚠Ⓢ	ECEA1HS331	330
C819 Ⓢ	ECKD1H103ZF	0.01
C820 Ⓢ	ECEA1ES470	47
C821 Ⓢ	ECEA1ES101	100
C822 Ⓢ	ECKD1H103ZF	0.01
C823 Ⓢ	ECEA1AS470	47
C824 ⚠	ECEA1VU102	1000
C825 ⚠Ⓢ	ECKD2H103PE	0.01
C830,831 ⚠Ⓢ	ECKD2H103PE	0.01
C832	ECEA1HU471	470
C833 Ⓢ	ECKD1H103ZF	0.01
C834 Ⓢ	ECEA1ES470	47
C835 ⚠	ECEA1HNR47S	0.47
C901	ECBT1C103ZYY	0.01
C902 Ⓢ	ECEA25M4R7R	4.7
C903 Ⓢ	ECEA1HS100	10
C904,905	ECBT1C103ZYY	0.01
C906	ECEA0JU102	1000
C907 Ⓢ	ECCD1H070CC	7P
C908 Ⓢ	ECCD1H180KC	18P
C909	ECEA0JU102	1000
C910 Ⓢ	ECEA1HS470	47
C911 Ⓢ	ECEA1VS330	33
C912 Ⓢ	ECEA1HS100	10
C913 Ⓢ	ECEA1AS221	220
C914,915 Ⓢ	ECEA50Z1	1
C916 Ⓢ	ECEA50Z1	1
C1001 ⚠	ECKDKC103PF2	0.01

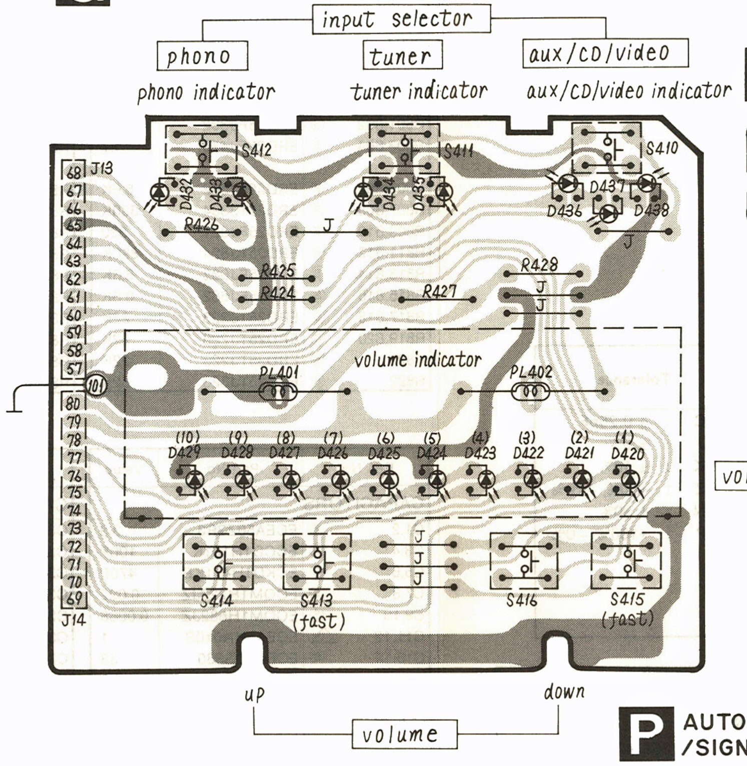
■ PRINTED CIRCUIT BOARDS

▨ Ground (Earth) lines

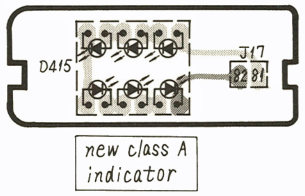
A FM/AM TUNER CIRCUIT


GND
FM ANT
AM ANT
AM LOOP ANT
75Ω
300Ω BALANCED
FM FRONT-END
IC201
IC202
IC301
Q201
Q202
Q203
Q204
Q205
Q206
Q207
Q208
Q209
Q210
Q301
Q302
Q303
Q304
TP202
TP203
FM off-set voltage (0mV)
TP301
19kHz output

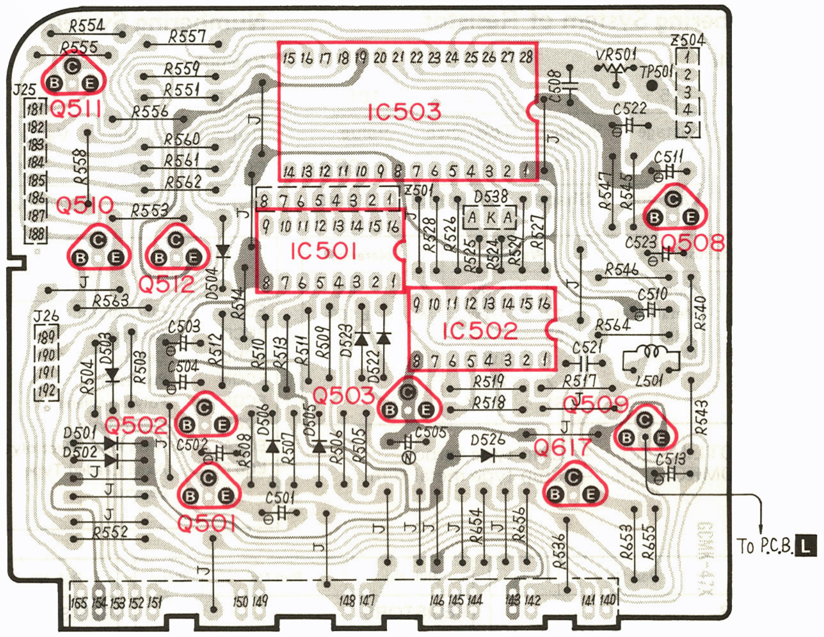
G VOLUME LEVEL IND. CIRCUIT


input selector
phono
tuner
aux/CD/video
phono indicator
tuner indicator
aux/CD/video indicator
volume indicator
volume level indicator
S414
S413 (fast)
S416
S415 (fast)
up
down
volume

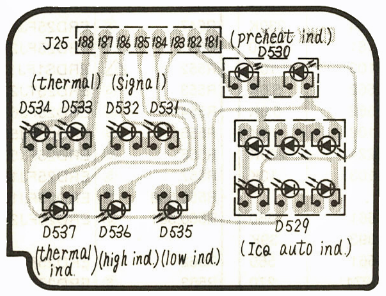
F NEW CLASS A IND.


D415
J17
new class A indicator

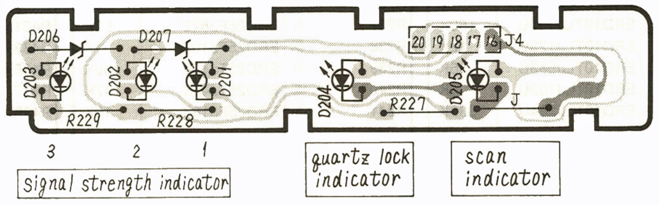
K ICQ CONTROLLER / RELAY DRIVE /OVER LOAD DET. CIRCUIT


IC501
IC502
IC503
Q501
Q502
Q503
Q508
Q509
Q510
Q511
Q512
Q617
To P.C.B. L

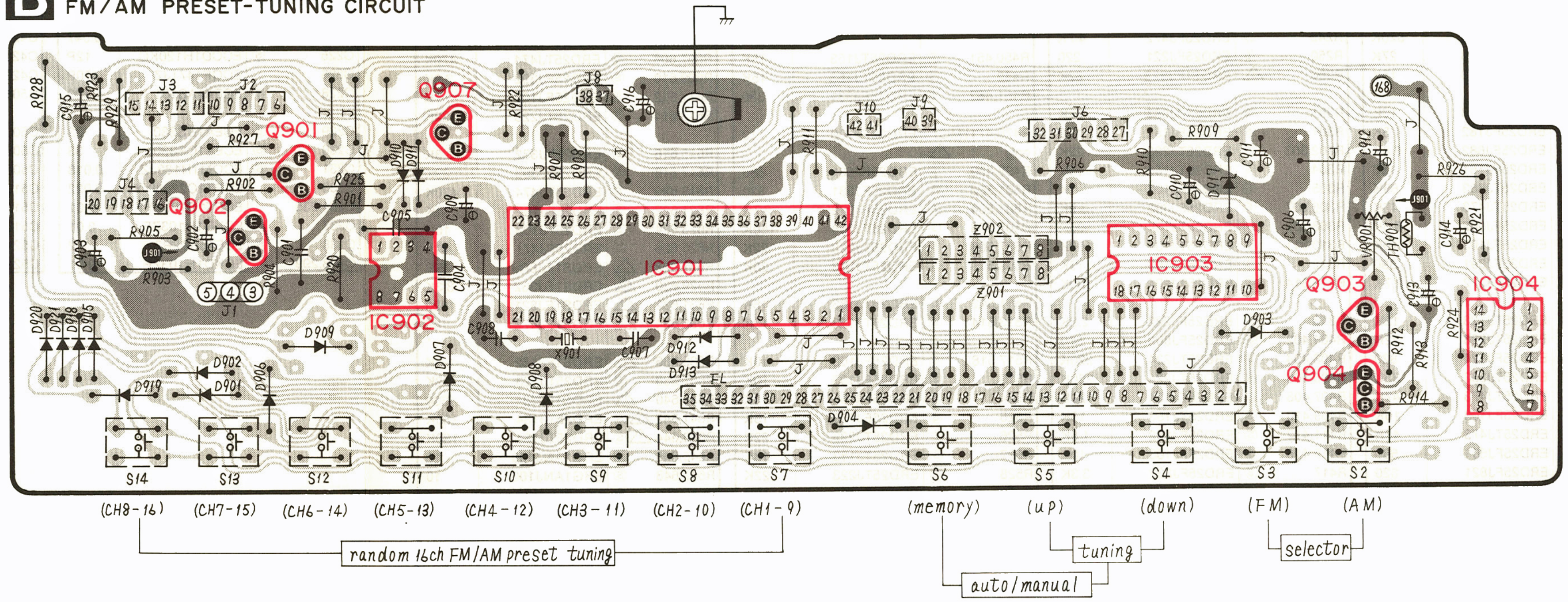
P AUTO / PRE-HEAT /SIGNAL / LOW / HIGH IND.


J26
(preheat ind.)
D530
(thermal)
(Signal)
D534 D533 D532 D531
D537 D536 D535
D529
(thermal ind)
(high ind)
(low ind)
(Icq auto ind)

C AUTO SCAN / QUARTZ LOCK /SIGNAL STRENGTH IND.


J4
3 2 1
signal strength indicator
quartz lock indicator
scan indicator

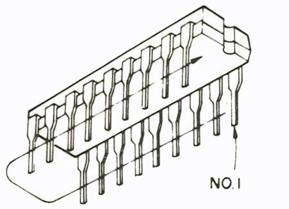
B FM/AM PRESET-TUNING CIRCUIT


IC901
IC902
IC903
IC904
Q901
Q902
Q903
Q904
Q907
S14 S13 S12 S11 S10 S9 S8 S7 S6 S5 S4 S3 S2
(CH8-16)
(CH7-15)
(CH6-14)
(CH5-13)
(CH4-12)
(CH3-11)
(CH2-10)
(CH1-9)
random 16ch FM/AM preset tuning
(memory)
(up)
(down)
tuning
auto/manual
(FM)
(AM)
selector

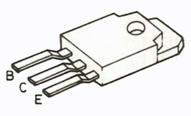
SA-510 SA-510

• Terminal guide of transistors, diodes and IC's

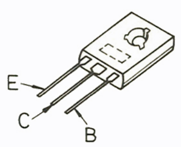
Type	Pins
AN6558F SVIUPB553C-E	8pin
AN7062 MN6631 MN6632 AN6873N	18pin
SVITD62501P SVIUPC1018C SVIUPC1167C2 SVIUPC1161C3 SVITA7612AP	16pin
MN1421STA	28pin
SVIUPD4011BC	14pin



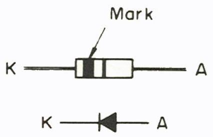
2SC3182, 2SA1265



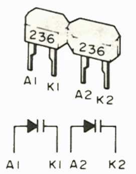
2SC2824, 2SA1184



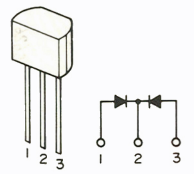
MA162A



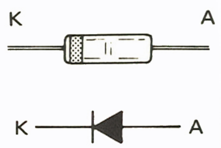
SVDKV1236Z


236
236
A1
K1
A2
K2
A1
K1
A2
K2

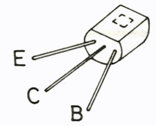
SVDMC921



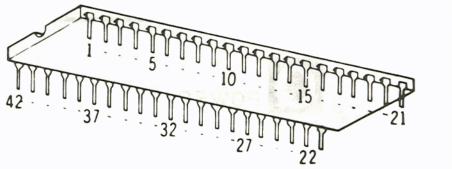
MA150, MA27WA



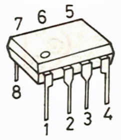
2SA1123, 2SC1685, 2SA564A, 2SC2631, 2SC1383, 2SJ103, 2SA992, 2SC945, 2SA684NC, 2SD1011, 2SC1509, 2SC1845



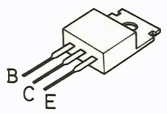
SVID1704C525


1
5
10
15
42
37
32
27
22
21

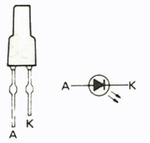
**AN6552
SVINJ4559DSM
SVINJM2043DD**



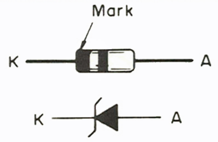
2SD762



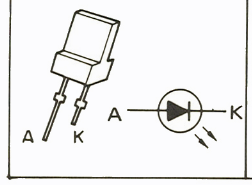
**SVDAY5533K-M
LN846RP
LN346GP**



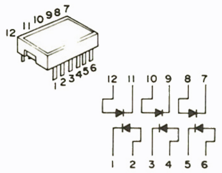
**MA1062M, MA1270M
MA1160L, MA1180M
MA1030L**



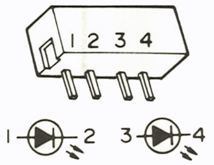
LN446YP



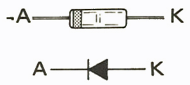
LN0603GP3G


12 11 10 9 8 7
1 2 3 4 5 6
12 11 10 9 8 7
1 2 3 4 5 6

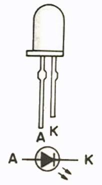
LN0202YP4



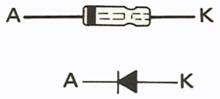
OA90



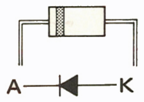
LN41YPHLMS



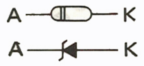
20A90

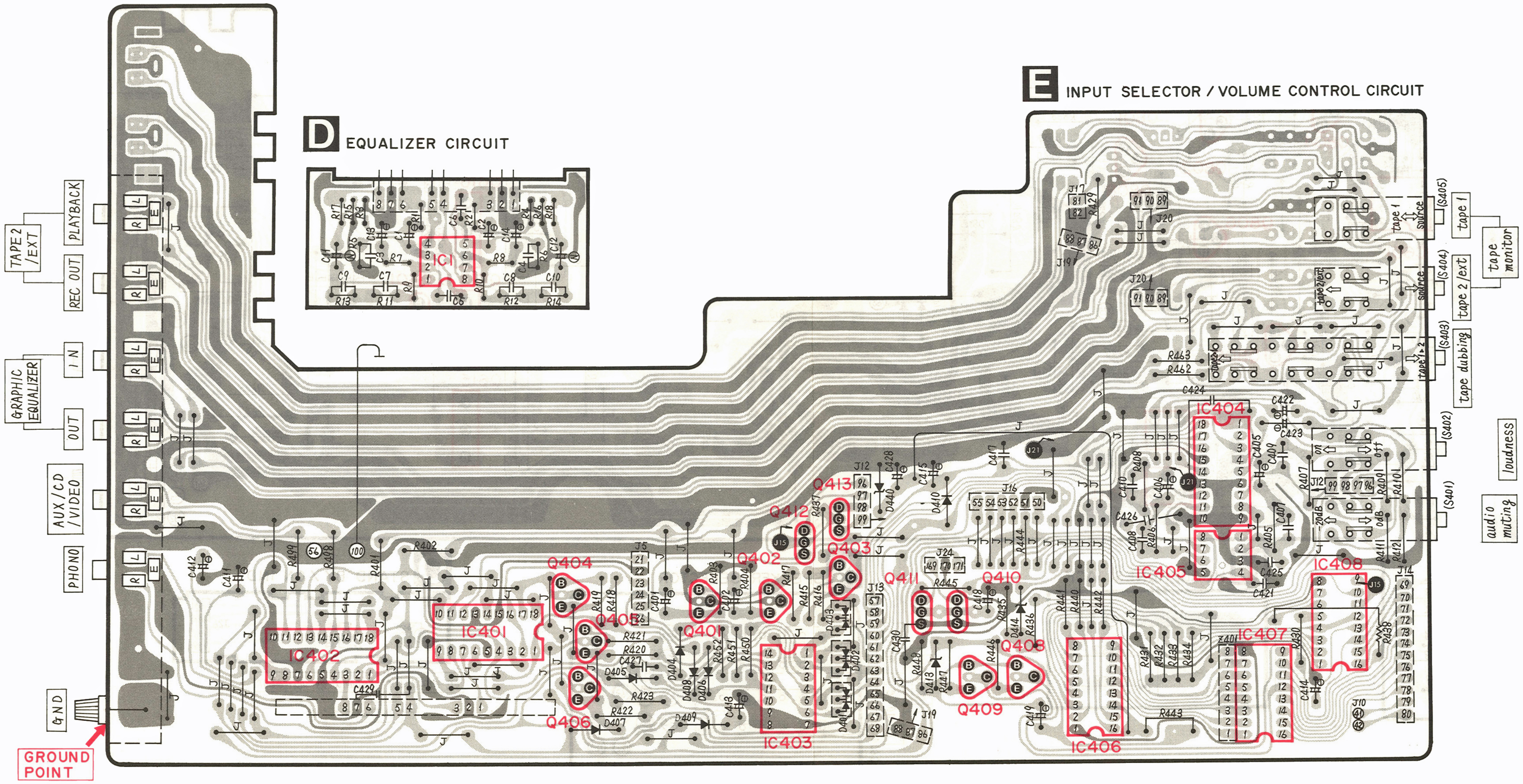


**SVDSR1K2
SVDS3V20**



**SVDMZ303B
SVDMZ309A
SVDMZ308B**




D EQUALIZER CIRCUIT
IC1
E INPUT SELECTOR / VOLUME CONTROL CIRCUIT
TAPE 2 /EXT
PLAYBACK
REC OUT
GRAPHIC EQUALIZER
IN
OUT
AUX/CD /VIDEO
PHONO
GND
GROUND POINT
tape 1
tape monitor
tape 2/ext
tape dubbing
loudness
audio muting
(S405)
(S404)
(S403)
(S402)
(S401)
IC401
IC402
IC403
IC404
IC405
IC406
IC407
IC408
Q401
Q402
Q403
Q404
Q405
Q406
Q408
Q409
Q410
Q411
Q412
Q413

REPLACEMENT PARTS LIST

Notes:

(1) Mentioned in this parts list are only those changed in Model No. SA-510 for destination [M] area.

(2) Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

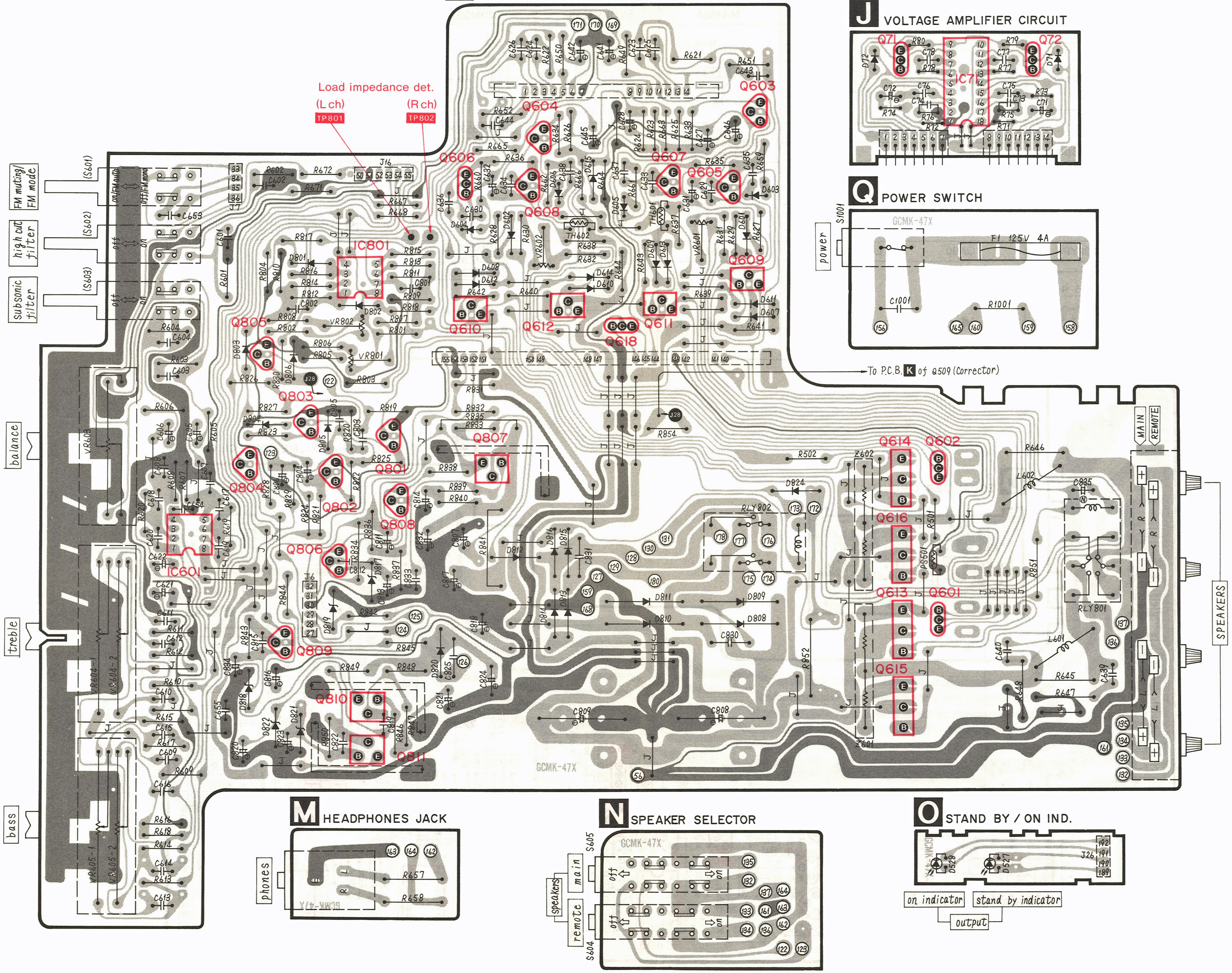
(3) The "Ⓢ" mark is service standard parts and may differ from production parts.

(4) "Ⓚ" marked parts are used for black type only, while "○" marked parts are for silver type only.

(5) Parts other than "Ⓚ" and "○" marked are used for both black and silver types.

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SA-510 [M]	→ SA-510 [PA], [PE], [PC], [K-PC]			
TRANSISTORS					
Q905	Addition	2SC1685–Q	Transistor	1	Ⓢ
Q906	Addition	2SA722–S	Transistor	1	Ⓢ
DIODES					
D203	LN346GP	○ LN346GP	Diode, Signal Strength (3)	1	
		Ⓚ LN446YP	Diode, Signal Strength (3)	1	
D415	LN0603QP3G	○ LN0603GP3G	Diode, New Class A Indicator	1	
		Ⓚ LN0603YP4	Diode, New Class A Indicator	1	
D914, 916	Addition	MA162A	Diode	2	Ⓢ
COIL					
L203	Addition	SLQZ10G1–D	Choke	1	
FUSES					
F1	XB1F40NU14	XBA2C31TR0	250V, T3.15A	1	⚠
F2	Addition	XBA2C16TR0	250V, T1.6A	1	⚠
TRANSFORMERS					
T1	SLT5N419	SLT5N423	Power Source	1	⚠
SWITCHES					
S16	Addition	ESE37219	Voltage Selector	1	⚠
S408	Addition	SSS43	Allocation	1	
THERMISTOR					
TH201	Addition	ERTD2FHL103S	10kΩ	1	
RESISTORS					
R208	ERD25FJ103	ERD25TJ153	15kΩ	1	Ⓢ
R915, 917	Addition	ERD25TJ104	100kΩ	2	Ⓢ
R916	Addition	ERD25TJ273	27kΩ	1	Ⓢ
R918	Addition	ERD25TJ224	220kΩ	1	Ⓢ
R919	Addition	ERD25TJ824	820kΩ	1	Ⓢ
R1001	ERC12ZGK335	Deletion	Solid, 3.3MΩ	0	
CABINET and CHASSIS PARTS					
1	SGW4650PA	○ SGW4650PA	Front Panel Ass'y (Silver)	1	
		Ⓚ SGW4650BA	Front Panel Ass'y (Black)	1	
2	SGU347SA	○ SGU347SB	Transparent Plate (Silver)	1	
		Ⓚ SGU347BA	Transparent Plate (Black)	1	
3	SGXA510M	○ SGXA510M	Grille (Silver)	1	
		Ⓚ SGXA510KP	Grille (Black)	1	

L TONE CONTROL / POWER AMP. / REGULATOR CIRCUIT


Load impedance det.
(L ch)
TP801
(R ch)
TP802
FM muting/ FM mode
high cut filter
subsonic filter
(S601)
(S602)
(S603)
balance
treble
bass
VR603
VR604-1
VR604-2
VR605-1
VR605-2
IC601
IC801
Q603
Q604
Q605
Q606
Q607
Q608
Q609
Q610
Q611
Q612
Q618
Q801
Q802
Q803
Q804
Q805
Q806
Q807
Q808
Q809
Q810
Q811
Q601
Q602
Q613
Q614
Q615
Q616
RLY801
RLY802
L601
L602
TH601
TH602
VR601
VR801
VR802
To P.C.B. K of Q509 (Corrector)
MAIN
REMOTE
SPEAKERS
GCMK-47X

J VOLTAGE AMPLIFIER CIRCUIT

Q71
Q72
IC71
E
C
B

Q POWER SWITCH

S1001
power
GCMK-47X
F1 125V 4A
C1001
R1001

M HEADPHONES JACK

phones
R657
R658
GCMK-47X

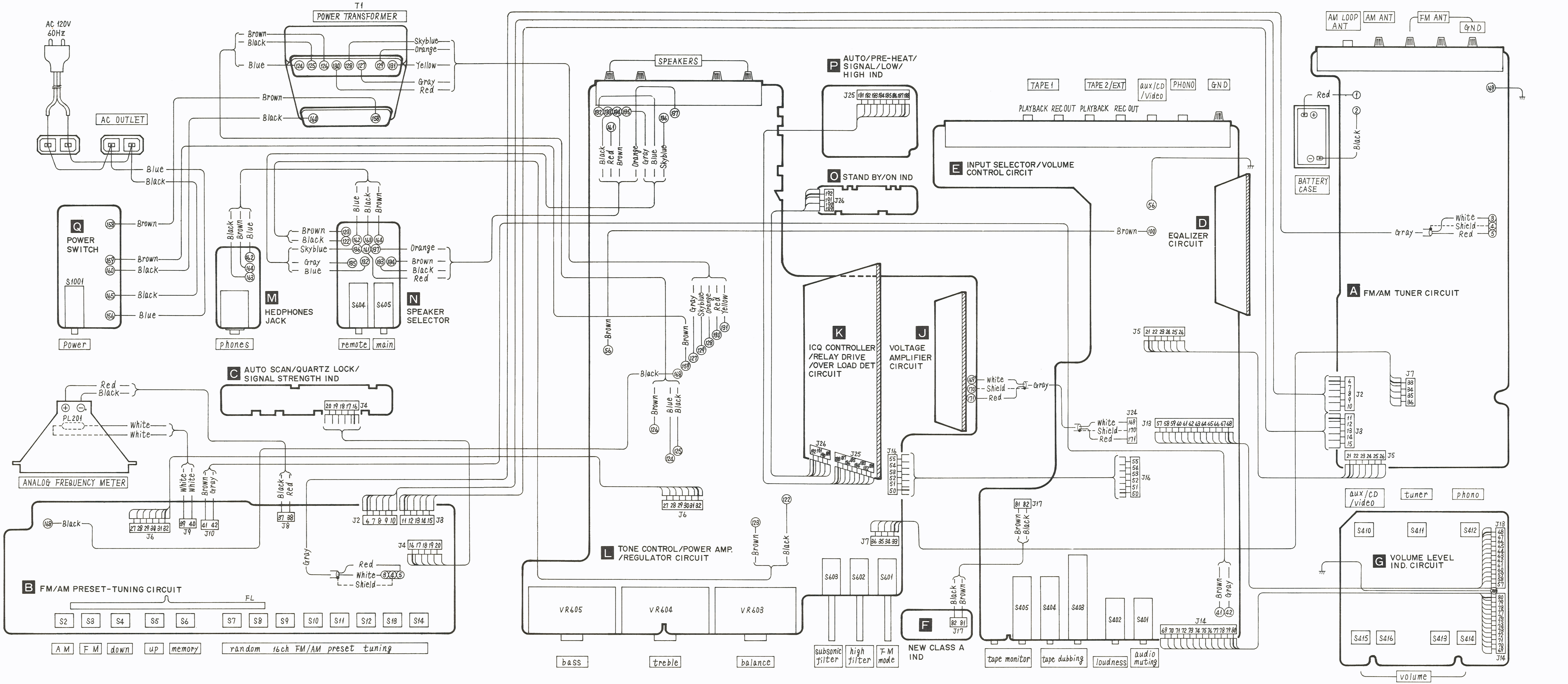
N SPEAKER SELECTOR

S605
main
speakers
remote
S604
off
on
GCMK-47X

O STAND BY / ON IND.

D528
D527
J26
on indicator
stand by indicator
output

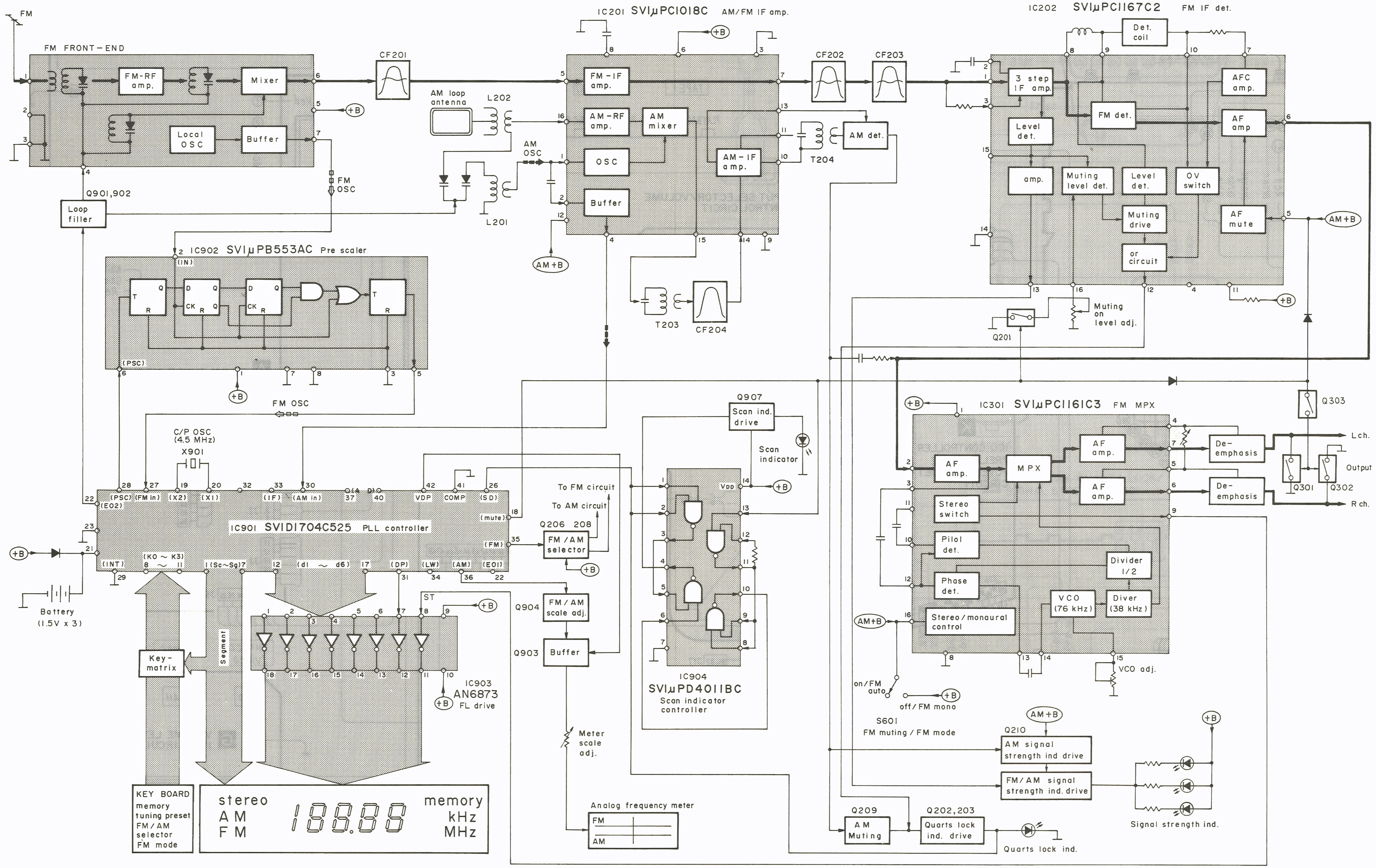
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM (Top View)


AC 120V 60Hz
AC OUTLET
T1 POWER TRANSFORMER
SPEAKERS
P AUTO/PRE-HEAT/ SIGNAL/LOW/ HIGH IND
J25
O STAND BY/ON IND
J26
TAPE 1
TAPE 2/EXT
aux/CD /Video
PHONO
GND
PLAYBACK REC OUT PLAYBACK REC OUT
E INPUT SELECTOR/VOLUME CONTROL CIRCIT
D EQALIZER CIRCUIT
AM LOOP ANT
AM ANT
FM ANT
GND
BATTERY CASE
A FM/AM TUNER CIRCUIT
Q POWER SWITCH
S1001
Power
M HEDPHONES JACK
phones
N SPEAKER SELECTOR
S604
S605
remote
main
C AUTO SCAN/QUARTZ LOCK/ SIGNAL STRENGTH IND
J4
PL201
ANALOG FREQUENCY METER
K ICQ CONTROLLER /RELAY DRIVE /OVER LOAD DET CIRCUIT
J VOLTAGE AMPLIFIER CIRCUIT
J16
J24
J18
J5
J7
J2
J3
J6
J9
J10
J8
J17
J14
J13
B FM/AM PRESET-TUNING CIRCUIT
FL
S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14
AM
FM
down
up
memory
random 16ch FM/AM preset tuning
L TONE CONTROL/POWER AMP. /REGULATOR CIRCUIT
VR605
VR604
VR603
bass
treble
balance
S603
S602
S601
subsonic filter
high filter
FM mode
F NEW CLASS A IND
S405
S404
S403
S402
S401
tape monitor
tape dubbing
loudness
audio muting
aux/CD /video
tuner
phono
G VOLUME LEVEL IND. CIRCUIT
S410
S411
S412
S415
S416
S413
S414
volume
Red
Black
Brown
Blue
White
Gray
Shield
Orange
Skyblue
Yellow

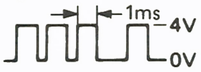
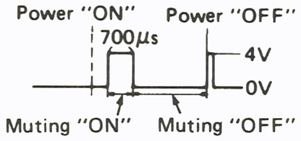
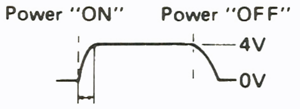
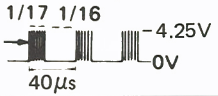
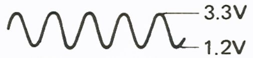
■ BLOCK DIAGRAM

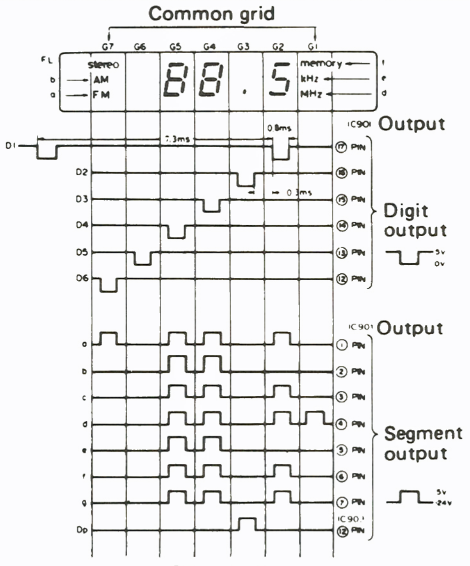
• Tuner (FM/AM) circuit

* Power amplifier, volume control and other block diagram, refer on page 35.


FM
FM FRONT-END
FM-RF amp.
Mixer
Local OSC
Buffer
+B
FM OSC
Q901,902
Loop filler
CF201
AM loop antenna
L202
AM OSC
L201
IC201 SVIμPC1018C AM/FM IF amp.
FM-IF amp.
AM-RF amp.
AM mixer
OSC
Buffer
AM-IF amp.
AM+B
T204
AM det.
T203
CF204
CF202
CF203
IC202 SVIμPC1167C2 FM IF det.
Det. coil
3 step IF amp.
Level det.
FM det.
AFC amp.
AF amp
amp.
Muting level det.
Level det.
OV switch
Muting drive
AF mute
or circuit
Muting on level adj.
Q201
IC902 SVIμPB553AC Pre scaler
(IN)
(PSC)
FM OSC
C/P OSC (4.5 MHz)
X901
IC901 SVID1704C525 PLL controller
(PSC) (FM in) (X2) (X1) (IF) (AM in) VDP COMP (SD)
(EO2)
(mute)
(FM)
(INT) (KO ~ K3) (Sc~Sg) (d1 ~ d6) (DP) (LW) (AM) (EO1)
To FM circuit
To AM circuit
Q206 208
FM/AM selector
Q904
FM/AM scale adj.
Q903
Buffer
Meter scale adj.
Analog frequency meter
FM
AM
Q907
Scan ind. drive
Scan indicator
IC904
SVIμPD4011BC
Scan indicator controller
VDD
ST
IC903
AN6873
FL drive
Battery (1.5V x 3)
Key-matrix
Segment
KEY BOARD
memory
tuning preset
FM/AM selector
FM mode
stereo
AM
FM
188.88
memory
kHz
MHz
IC301 SVIμPC1161C3 FM MPX
AF amp.
MPX
AF amp.
AF amp.
Stereo switch
Pilot det.
Phase det.
Divider 1/2
VCO (76 kHz)
Diver (38 kHz)
Stereo/monaural control
VCO adj.
De-emphasis
De-emphasis
Q303
Q301
Q302
Lch.
Output
R ch.
on/FM auto
off/FM mono
S601
FM muting / FM mode
Q210
AM signal strength ind drive
FM/AM signal strength ind. drive
Signal strength ind.
Q209
AM Muting
Q202,203
Quarts lock ind. drive
Quarts lock ind.

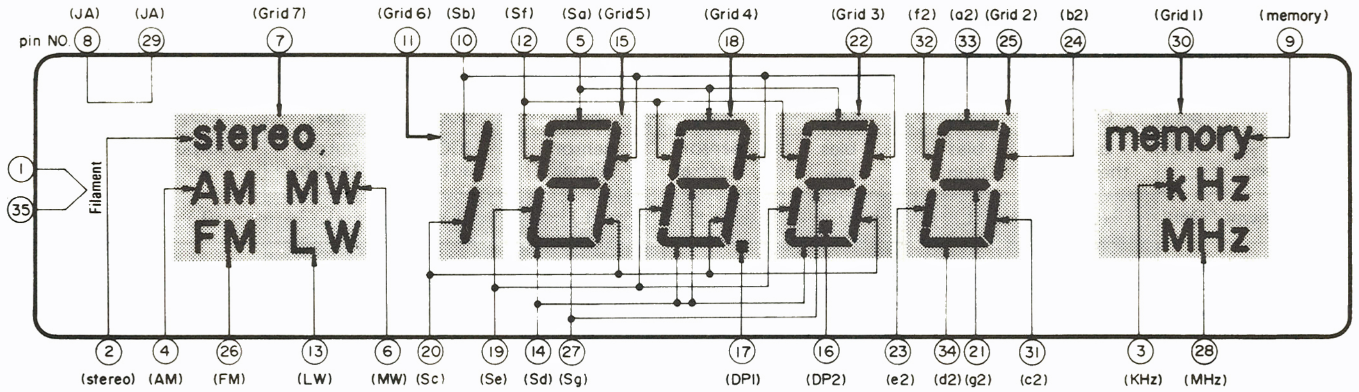
■ FUNCTION OF TERMINAL (PLL CONTROLLER IC901)

Pin No.	Mark	Description of terminal
1	Sa	Segment signal output terminal for display. (Refer to Fig. 21)
2	Sb	
3	Sc	
4	Sd	
5	Se	
6	Sf	
7	Sg	
8	K0	Input terminal for key return signal from external key matrix. The output of segment terminals (a ~ g) is used as the key return signal source. 
9	K1	
10	K2	
11	K3	
12	D6	Digit signal output terminal for display. (Refer to Fig. 21)
13	D5	
14	D4	
15	D3	
16	D2	
17	D1	
18	MT	This is the output terminal to eliminate shock noise due to unlocking at PLL. When the CE terminal is at low level, the output from this terminal is at high level.  Power "ON" Power "OFF" 700µs 4V 0V Muting "ON" Muting "OFF"
19	X2	Connecting terminal for crystal oscillator. The crystal connected is at 4.5 MHz.
20	X1	
21	VDD	Power supply terminal of the device.
22	E01	When the divided oscillation frequency is higher than the standard frequency, H-level output is delivered from these terminals. When it is lower, L-level (0V) output is delivered. When they coincide, it results in floating.
23	GND	Ground terminal.
24	E02	Not used in this unit.
25	CE	This is the selected signal input terminal of the device. When operating the device, make the level high, and when it is not used, make the level low. When this terminal is at low level, all the segment (a ~ g) and digits (D1 ~ D6) terminals are off, but the memory is held.  Power "ON" Power "OFF" 4V 0V The device does not operate during this period.
26	SD	This input terminal detects the reception of a broadcasting station. The voltage is 4.2V during reception, and otherwise 0V.
27	FM	Input terminal for FM OSC output frequency-divided to 1/16 or 1/17 by pre-scaler.
28	PSC	This is the terminal to deliver the frequency dividing ratio changeover output signal to the pre-scaler. The terminal continues to produce pulses at the rise of the signal applied to FM terminal (27) until the content of the inside swallow counter is 0. When the swallow counter comes to 0, the terminal level becomes low, then the frequency dividing ratio of pre-scaler is 1/16. Pulse two times larger than the value that cannot be divided by VCO/16.  1/17 1/16 4.25V 0V 40µs
29	INT	This is the interrupt demand signal input terminal. The signal from the control input terminal is put into this terminal, demanding for interruption, then the flow of program will be unconditionally shifted to the address No. 1.
30	AM	Input terminal for AM OSC output.  1 MHz ~ 2 MHz
31	PC2	This is 2-bit input/output port, DP terminal (31) is the decimal indication output terminal for the digital display (32) is not used in this unit.
32	PC3	
33	PB0	This is 4-bit input/output port. PB2 terminal (35) is the FM/AM changeover output terminal, which is 5V in FM, and 0V in AM. PB3 terminal (36) is the FM/AM changeover terminal, which is 5V in AM, and 0V in FM. Other terminals are not used in this unit.
34	PB1	
35	PB2	
36	PB3	
37	PA0	This is 4-bit input/output port. (Not used in this unit)
38	PA1	
39	PA2	
40	PA3	
41	PD3	One-bit input/output port. (Not used in this unit.)
42	VDP	One-bit output port. Output signal is emitted to operate the analog frequency meter, and the output voltage varies according to the frequency.


Common grid
G7
G6
G5
G4
G3
G2
G1
FL
b
a
stereo
AM
FM
memory
kHz
MHz
D1
7.3ms
0.8ms
D2
D3
D4
D5
D6
IC901 Output
⑰ PIN
⑯ PIN
⑮ PIN
⑭ PIN
⑬ PIN
⑫ PIN
Digit output
5V
0V
IC901 Output
a
b
c
d
e
f
g
Dp
① PIN
② PIN
③ PIN
④ PIN
⑤ PIN
⑥ PIN
⑦ PIN
IC901
㉛ PIN
Segment output
5V
24V

[Fig. 21]

• Fluorescent Display Tube (FL)


(JA)
(JA)
(Grid 7)
(Grid 6)
(Sb)
(Sf)
(Sa)
(Grid5)
(Grid 4)
(Grid 3)
(f2)
(a2)
(Grid 2)
(b2)
(Grid 1)
(memory)
pin NO. 8 29 7 11 10 12 5 15 18 22 32 33 25 24 30 9
1
35
Filament
stereo
AM MW
FM LW
memory
kHz
MHz
2 4 26 13 6 20 19 14 27 17 16 23 34 21 31 3 28
(stereo)
(AM)
(FM)
(LW)
(MW)
(Sc)
(Se)
(Sd)
(Sg)
(DPl)
(DP2)
(e2)
(d2)
(g2)
(c2)
(KHz)
(MHz)

■ DESCRIPTION OF SPEAKER IMPEDANCE DETECTION CIRCUIT

This circuit serves to detect the impedance of speaker connected to the speaker terminals and to change the secondary tap voltage of power transformer according to the speaker impedance. It consists of a voltage comparing circuit, reset circuit, detection signal generating circuit, and speaker select relay drive circuit.

1) Reset circuit and detection signal generating circuit

The reset switch of speaker select switch is short-circuited only when the switch is shifted, with the speaker select switch shifted, the reset switch is short-circuited, then Q804 of reset circuit turns ON. When Q804 turns ON, positive voltage as in Fig. 22-A is generated at the collector of Q804, causing Q801 to turn ON.

When Q801 turns ON, Q509 turns OFF, and so does RLY801.

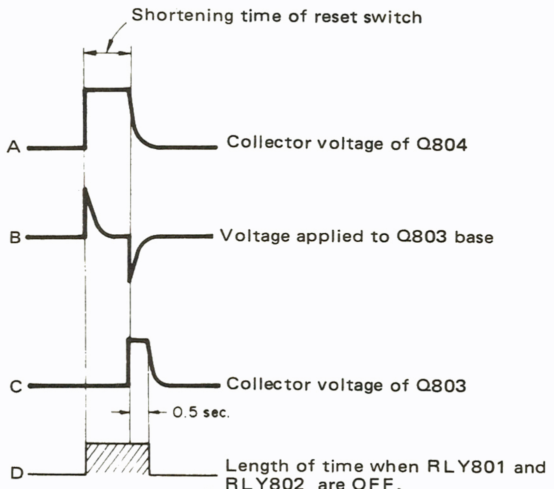
Also, when Q509 turns OFF, the collector potential of Q509 becomes positive, causing Q805 to turn OFF.

When the reset switch is open, a voltage as in Fig. 22-B is applied to the base of Q803 due to the charge and discharge of C803.

With Q803 turned ON, a voltage as in Fig. 22-C is generated at the collector of Q803. The voltage causes Q801 to turn ON.

When Q801 turns ON, RLY801 turns OFF and so does RLY802 (high volt tap). That is, both RLY801 and RLY802 are OFF during short-circuit of reset switch and for 0.5sec. more after opening the switch.

Also, when power switch is turned ON, C806 is charged with voltage, then the base voltage of Q804 becomes 0V and Q804 turns ON. Then both RLY801 and RLY802 turn OFF, and the speaker impedance detecting circuit operate. About 0.5sec. after power switch ON, C806 is discharged and Q804 turns OFF.



[Fig. 22]

2) Voltage comparing circuit

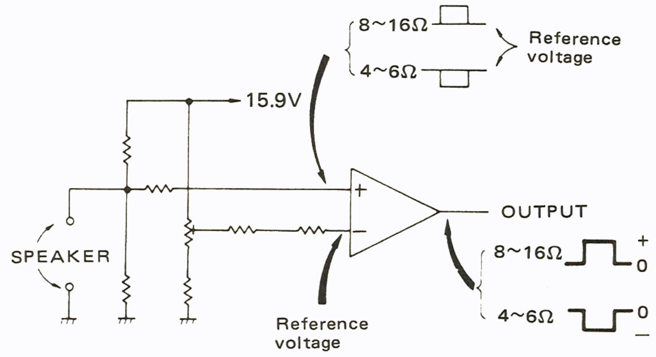
IC801 is a voltage comparing circuit. With RLY801 turned OFF, the speaker is connected to the voltage comparing circuit. (Fig. 23) The reference voltage is applied to minus terminals (② , ⑥) of IC801.

Also, plus terminals (③ , ⑤) of IC801 are subject to change according to the impedance of the speaker connected to the set.

The adjustment has been made with VR801 and VR802 so that the output voltage of IC801 is 0V with 6.5Ω speaker connected. If the impedance of the speaker connected is 4Ω, the output voltage of IC801 becomes negative, causing Q805 to turn ON.

Then RLY802 also turns ON (low volt tap).

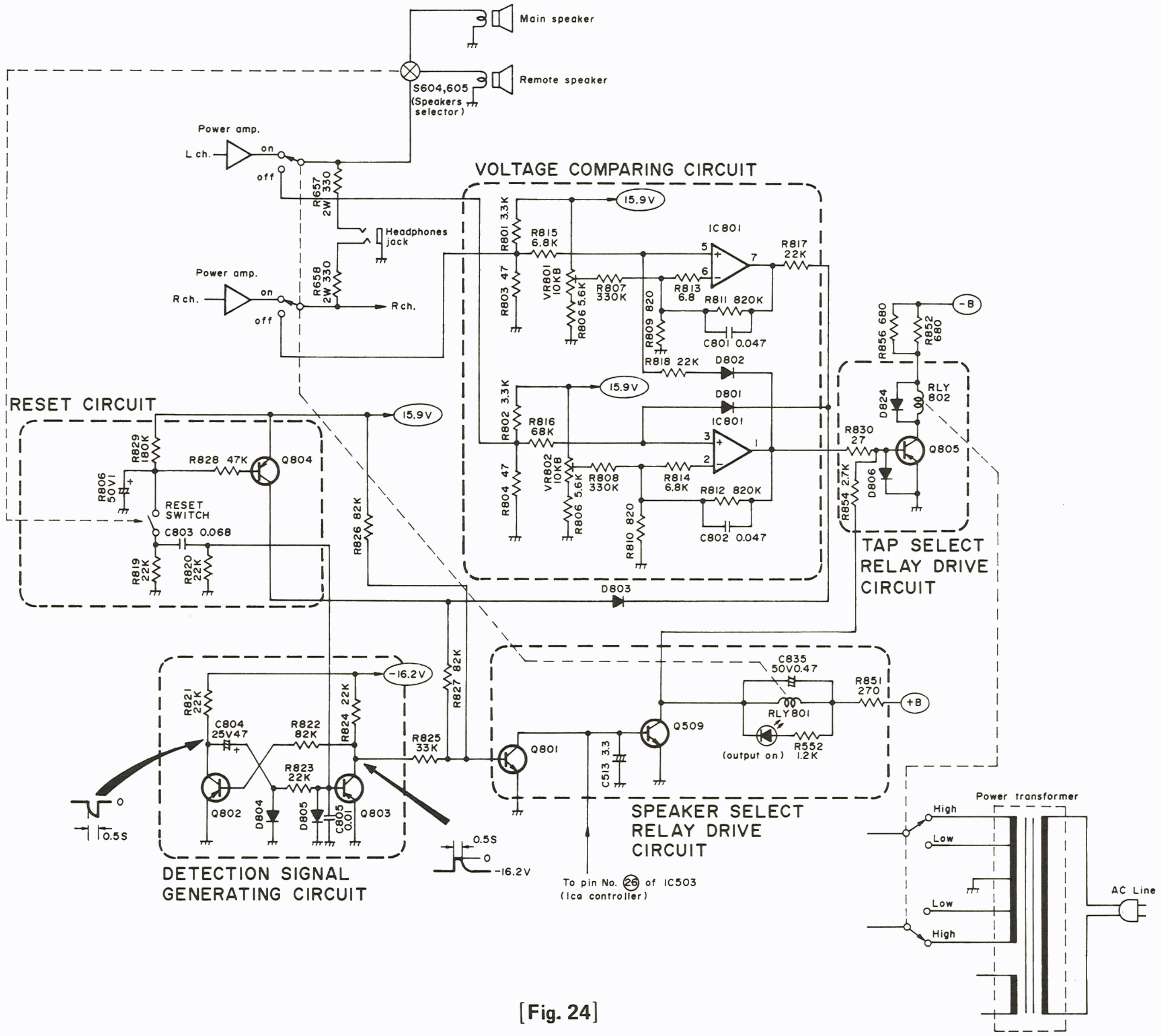
If the speaker impedance is 8Ω, the output voltage of IC801 becomes positive, then Q805 turns OFF and RLY802 also turns OFF (high volt tap).


8~16Ω
4~6Ω
Reference voltage
15.9V
+
−
OUTPUT
8~16Ω
+
0
4~6Ω
0
−
SPEAKER
Reference voltage

[Fig. 23]

3) Voltage comparing circuit and reset circuit

The operation amplifier of voltage comparing circuit has a nature to hold the impedance 8Ω, or 4Ω once detected. So, if a speaker with different impedance is connected, it is necessary to turn OFF the power supply or shift the speaker select switch before operating the reset circuit.


Main speaker
Remote speaker
S604,605 (Speakers selector)
Power amp.
L ch.
on
off
R657 2W 330
Headphones jack
Power amp.
R ch.
R658 2W 330
R ch.
VOLTAGE COMPARING CIRCUIT
15.9V
R801 3.3K
R815 6.8K
IC801
R817 22K
R803 47
VR801 10KB
R807 330K
R806 5.6K
R813 6.8
R811 820K
R809 820
C801 0.047
R818 22K
D802
R802 3.3K
15.9V
D801
R816 68K
IC801
R804 47
VR802 10KB
R808 330K
R806 5.6K
R814 6.8K
R812 820K
R810 820
C802 0.047
RESET CIRCUIT
15.9V
R829 180K
R828 47K
Q804
R806 50V1
RESET SWITCH
C803 0.068
R819 22K
R820 22K
R826 82K
D803
R856 680
R852 680
−B
RLY 802
D824
R830 27
Q805
R854 2.7K
D806
TAP SELECT RELAY DRIVE CIRCUIT
−16.2V
R821 22K
C804 25V47
R822 82K
R824 22K
R823 22K
R827 82K
R825 33K
Q802
D804
D805
C805 0.01
Q803
0
0.5S
0.5S
0
−16.2V
DETECTION SIGNAL GENERATING CIRCUIT
Q801
C513 3.3
Q509
C835 50V0.47
RLY801
R851 270
+B
(output on)
R552 1.2K
SPEAKER SELECT RELAY DRIVE CIRCUIT
To pin No. 28 of IC503 (Ics controller)
Power transformer
High
Low
Low
High
AC Line

[Fig. 24]

■ FUNCTION OF TERMINAL (VOLUME CONTROL IC404)

Pin No.	Mark	Name of block	Description of terminal
1	VDD	Power supply input terminal	Apply 5V
2	STEP	Test input terminal	Terminal for testing LSI
3	DISP OUT	Display output terminal	Volume level indicator drive output terminal
4	Vcc	Power supply input terminal	Apply 5V
5	VOL IN (1)	Volume input terminal (1)	L-channel volume input terminal
6	NC	Non-connection	Ground
7	VOL OUT (1)	Volume output terminal (1)	L-channel volume output terminal
8	Iout (1)	Current output terminal (1)	L-channel volume current output and feedback resistor connection terminal
9	GND (1)	Ground terminal (1)	L-channel ground terminal
10	GND (2)	Ground terminal (2)	R-channel ground terminal
11	Iout (2)	Current output terminal (2)	R-channel volume current output and feedback resistor connection terminal
12	VOL OUT (2)	Volume output terminal (2)	R-channel volume output terminal
13	NC	Non-connection	Ground
14	VOL IN (2)	Volume input terminal (2)	R-channel volume input terminal
15	Vss	Power supply input terminal	Ground (0V)
16	DOWN	Volume DOWN terminal	It serves to control volume DOWN. Volume down operation with "H" level input voltage applied.
17	UP	Volume UP terminal	It serves to control volume UP. Volume up operation with "H" level input voltage applied.
18	OSC	OSC input terminal	Clock signal (about 400 ~ 430 kHz) can be obtained by internal oscillation circuit.

■ FUNCTION OF TERMINAL (Icq CONTROLLER IC503)

Pin No.	Mark	Name of block	Description of terminal
1	Vss	Power supply input terminal	Grounded (0V)
2	CO_9	Output port C	It delivers Icq control signal through input port A (thermal sensor) and input port B (signal sensor). [Output "L"]
3	CO_8		
4	CO_7		
5	CO_6		
6	CO_5		
7	AI_3	Input port A	When DC detection circuit of power amplifier operates, the input level becomes "H".
8	AI_2		Not used in this unit.
9	AI_1		
10	AI_0		When70°C (158°F) sensor of power amplifier operates, the input level becomes "L".
11	BI_3	Input port B	Input level changes to "L" as effective output 2V signal sensor of power amplifier operates. (L ch.)
12	BI_2		Input level changes to "L" as effective output 5V signal sensor of power amplifier operates. (L ch.)
13	BI_1		Input level changes to "L" as effective output 2V signal sensor of power amplifier operates (R ch.)
14	BI_0		Input level changes to "L" as effective output 5V signal sensor of power amplifier operates (R ch.)
15	EO_0	Output port E	Indicator "thermal" lights up at "L" output.
16	EO_1		Indicator "signal" lights up at "L" output.
17	EO_2		Indicator "auto" lights up at "L" output.
18	EO_3		Indicator "stand by" lights up at "L" output.
19	TST	Test input terminal	Terminal for testing LSI (Grounded)
20	RST	Reset input terminal	All outputs are cleared or reset with input at "L" (It is connected to power supply circuit)
21	SNS_0	Sensor input terminal	Conditional transfer (branch) is performed according to the input level.
22	SNS_1		Input level changes to "H" as power amplifier output short-circuit operates.
23	DO_0	Output port D	Indicator "preheat" lights up at "L" output
24	DO_1		Not used in this unit.
25	DO_2		
26	DO_3		Output relay turns ON with output at "H"
27	VDD	Power supply input terminal	Apply 5V.
28	OSC	OSC input terminal	Clock signal (about 400 kHz) can be obtained by internal oscillation circuit.

■ OPERATION OF Icq CONTROLLER

- **ON-time of each indicator, and output generated at pin terminal of microcomputer (IC503)**

▨ "ON" (light up) time

	Output port	(4) pin CO_7	(2) pin CO_8	(3) pin CO_9	(15) pin EO_0	(16) pin EO_1	(17) pin EO_2	(18) pin EO_3	(26) pin DO_3	(23) pin DO_0
	sec. \ Ind.	bias thermal	bias high	bias low	sensor thermal	sensor signal	ICQ auto	output stand by	output on	ICQ preheat
6 sec.	Power "ON"	▨ Ⓛ	▨ Ⓛ	▨ Ⓛ	▨ Ⓛ	▨ Ⓛ	▨ Ⓛ	▨ Ⓛ	Ⓛ	▨ Ⓛ
	0.4 sec.	▨	▨	▨	▨	▨	▨	▨		▨
	0.8 sec.	Ⓗ	Ⓗ	▨	▨	▨	Ⓗ	Ⓗ		▨
	0.4 sec.			▨	▨	▨		▨ Ⓛ		▨
	0.4 sec.			▨	▨	▨		Ⓗ		▨
	0.4 sec.			▨	▨	▨		▨ Ⓛ		▨
	0.4 sec.		▨ Ⓛ	Ⓗ	▨	Ⓗ		Ⓗ		▨
	0.4 sec.		▨		▨			▨ Ⓛ		▨
	0.4 sec.		▨		▨			Ⓗ		▨
	0.4 sec.		▨		Ⓗ	▨ Ⓛ		▨ Ⓛ		▨
	0.4 sec.		▨			▨		Ⓗ		▨
	0.4 sec.		▨			▨		▨ Ⓛ		▨
	0.4 sec.	▨ Ⓛ	Ⓗ			Ⓗ		Ⓗ		▨
	0.4 sec.	▨						▨ Ⓛ		▨
	0.4 sec.	▨						Ⓗ		▨
	14 sec.	Ⓗ		▨ Ⓛ	▨ Ⓛ	▨ Ⓛ			▨ Relay ON	▨
	∫			Ⓗ	▨	▨	▨ Ⓛ		▨ Ⓗ	Ⓗ

Computer-drive monitor indicators

To prevent transient crossover distortion, a stabilized idling current (ICQ) through the power transistors is constantly necessary.

ICQ will vary with the signal level and the instantaneous temperature of the power transistors.

The microcomputer will optimize ICQ automatically by preheating the power transistors and sensing the signal level and the temperature of the power transistors.

* Transient crossover distortion is caused by momentary fluctuations of the ICQ level.

ICQ

When the power is turned on, the "preheat" indicator will illuminate. This shows that a high level of ICQ is flowing through the power transistors to achieve circuit stability quickly. When "auto" illuminates, the optimum ICQ level is flowing and being controlled by the microcomputer.

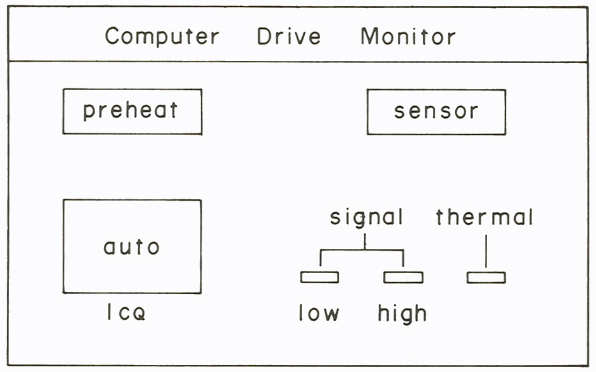
Sensor

- **Signal**

  When the signal level is very low, both the "low" and "high" indicators will illuminate. As the signal level is increased, the "low" indicator will go out. When the signal level is further increased, both indicators will be out.

- **thermal**

  When the "thermal" indicator illuminates, the temperature of the heatsink is low and no adjustment of ICQ is required by the microcomputer. When the "thermal" indicator goes off, the microcomputer is adjusting the ICQ because of the temperature rise of the heatsink,.



Output indicators (output)

These indicators show the condition of the signal sent to speakers or headphones.

When the power switch is switched on, the "stand by" indicator flashes, and, when the unit is operating normally, the "on" indicator will illuminate.

Note that the "stand by" indicator will flash if the positive and negative speaker terminals or speaker connection cords are short-circuited, or if some other circuit abnormality which causes the protection circuit to function os detected. If this occurs, switch the power switch off, and then on again after first determining the cause of the problem and correcting it.

1) Preheat

When power supply is turned ON, the level of IC503 pin ㉓ becomes low. At the same time, preheat LED (D530) lights up. Q510 turns ON, then voltage is applied to LED's (D533), (D536), (D537). Each of D533, D536 and D537 is controlled by IC503 terminals ② , ③ and ④ respectively. The output voltages are shown in Fig. 25. The "low" LED lights up first, followed by "high" LED, and then "thermal" LED. IC503 Pin ⑰ turns power supply ON as in Fig. 25. It becomes "H" 0.4 sec. later, then IC502 pin ⑤ (⑥) also becomes "H". IC502 pin ⑫ (⑪) changes to "L" and it is applied to Q617 (Q618), causing Q617 (Q618) to turn ON. IC502 pin ⑫ (⑪) delivers a large ICQ for 6 sec. after power ON (while pin ⑫ (⑪) is "L"), and after that, pin ⑫ (⑪) become 'H". ICQ is controlled by the output of IC503 pin ② , ③ , ④ .

2) Signal sensor and thermal sensor

The musical signal from power amplifier is applied to IC503 in ⑪ or ⑫ (pin ⑬ or ⑭) through D505 (D506) and IC501. When the signal changed to DC by D505 (D506) and C503 (C504), becomes about 2V, then "L" input is applied to IC503 pin ⑪ (pin ⑬), becomes about 5V, then "L" input is applied to IC503 pin ⑫ (pin ⑭), and the output is delivered to IC503 pin ② , ③ , ④ . Also, when the temperature of heat-sink becomes higher than 70°C the resistance of the thermistor (PS501) increases and IC501 pin ③ becomes "H". IC501 pin ⑭ changes to "L", then "L" input is applied to IC503 pin ⑩ . The output is delivered to IC503 pin ⑪ , ⑬ (pin ⑫ , ⑭) [signal sensor input] and IC503 pin ⑩(thermal sensor input), thereby controlling ICQ through R524, R527, R529 (R525, R526, R528) and Q617, Q618.

3) Power on/off muting

When power supply is turned ON, the output of IC503 pin ㉖ is "L" for about 6 sec. as in Fig. 25, then relay RLY801 turns OFF, and D528 output "on" LED also turns OFF. The voltage of IC503 pin ⑱ alternately becomes "L" and "H" for 6 sec. after power ON as in Fig. 25, causing D527 "stand by" LED to blink. IC503 pin ㉖ output becomes "H" 6 sec. after power ON, then relay RLY801 turns ON and D528 output "on" LED lights up.

When power supply is turned OFF, "H" is applied to IC502 pin ④ and IC502 pin ⑬ output changes to "L" because the time constant of C807 (1.5μF) and R832 (18kΩ) is smaller than that of C808 (12000μF) and R831 (82kΩ). The signal is put into IC503 pin ⑳ while "L" output is delivered to IC503 pin ㉖. When pin ㉖ becomes "L", Q509 turns OFF and so does relay RLY801.

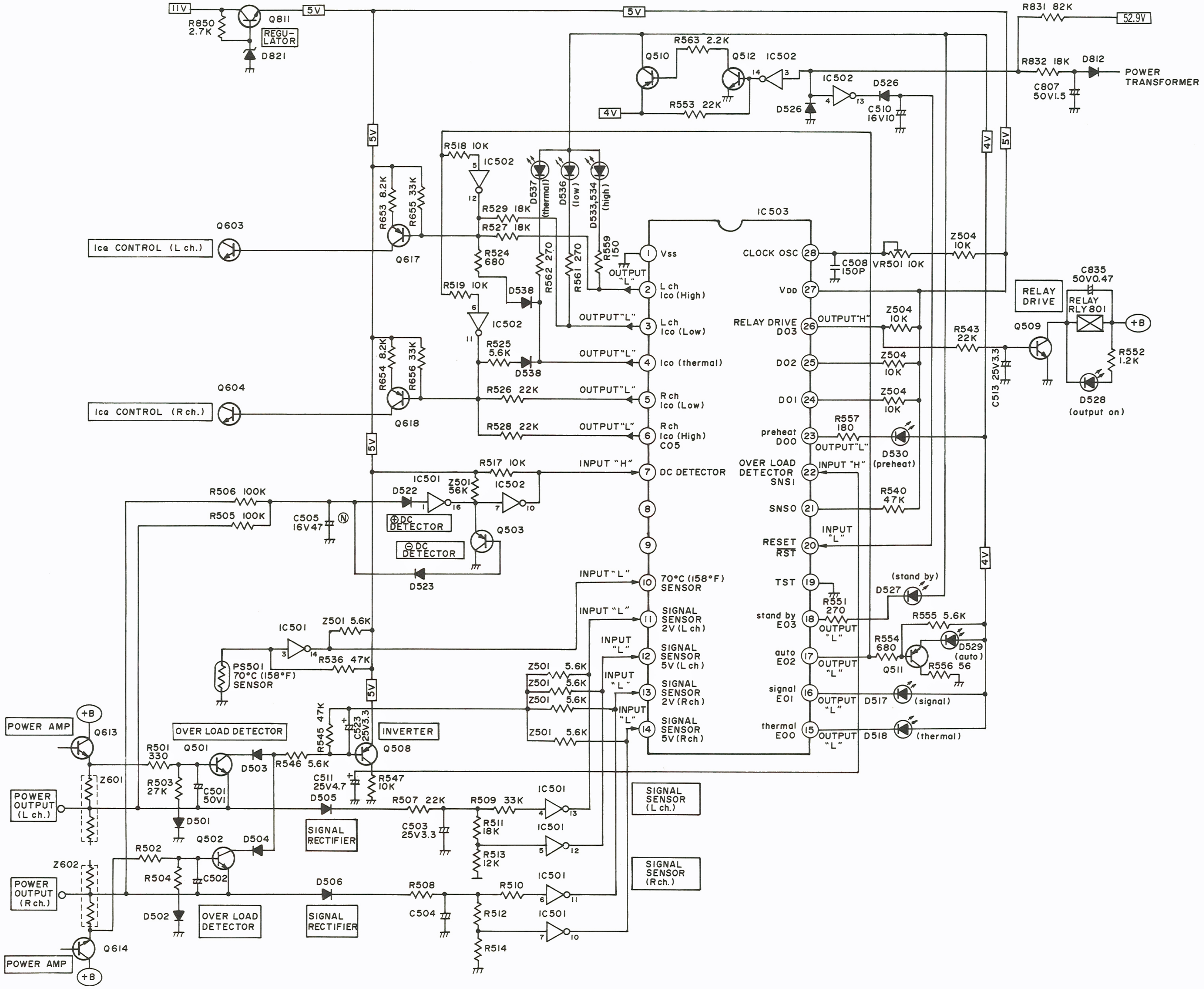
4) DC detection circuit

When the power amplifier voltage is over 2V DC. (IC501 pin ① (⊕ DC detection) and Q503 (⊖ DC detection) are turned ON, then "H" input is applied to IC503 pin ⑦ , and "L" output is delivered to IC503 pin ㉖ . When pin ㉖ becomes "L", relay RLY801 turns OFF the same as in power-off muting.

5) Overload detector circuit

When speaker terminals are short-circuited, a large amount of current flows into Z601 (Z602), and the base of voltage of Q501 (Q502) increases, causing Q501 (Q502 and Q508 to turn ON. As Q508 turns ON, "H" input is applied to IC503 pin ㉒ , and "L" output is delivered to IC503 pin ㉖ . When pin ㉖ becomes "L", relay RLY801 turns OFF the same as in power off muting.

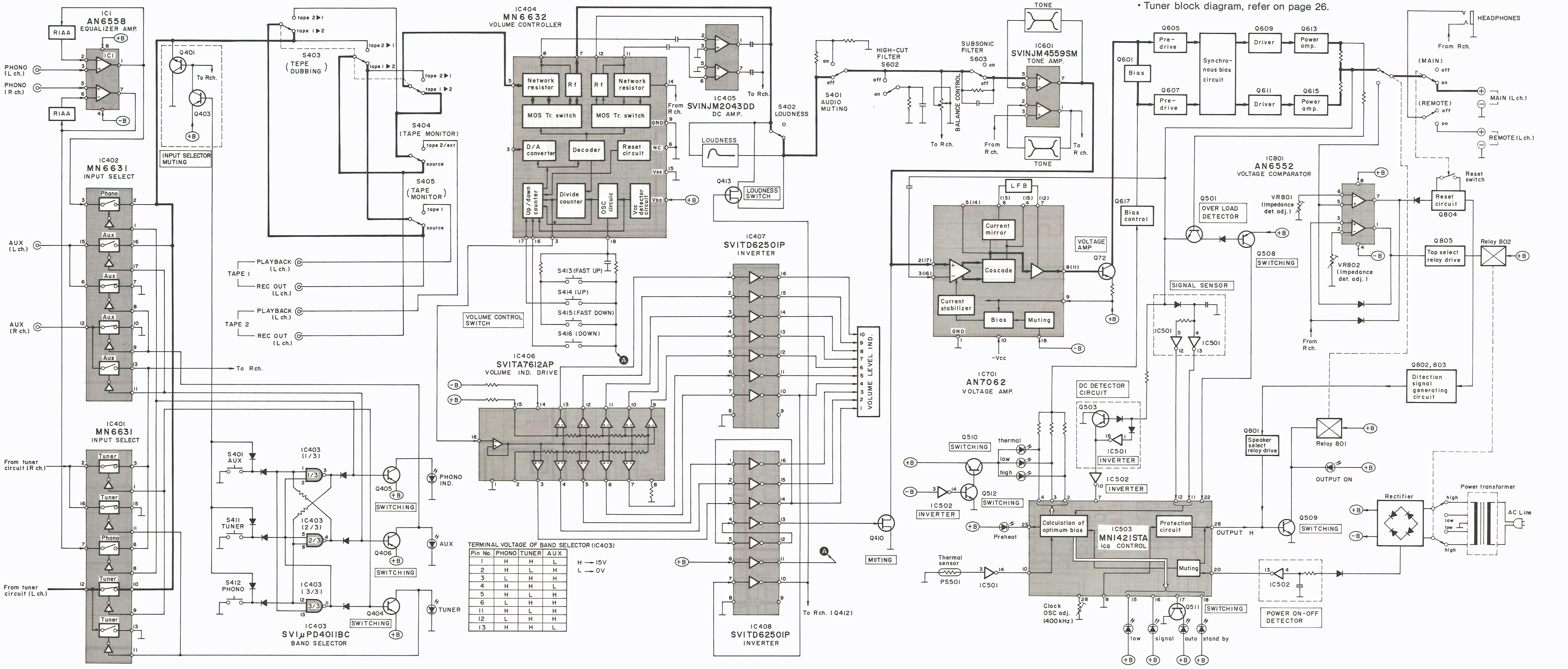
When "H" is applied to IC508 pin ㉒ , the output of IC503 pin ㉖ is held. Therefore, turn off the power switch and check the set beforehand. Otherwise, relay RLY801 will not turn ON.


11V
5V
R850 2.7K
Q811
REGU-LATOR
D821
R831 82K
52.9V
R563 2.2K
Q510
Q512
IC502
R553 22K
4V
D526
C510 16V10
R832 18K
D812
C807 50V1.5
POWER TRANSFORMER
R518 10K
D537 (thermal)
D536 (low)
D533,534 (high)
R529 18K
R527 18K
R524 680
R562 270
R561 270
R559 150
IC503
Vss
Lch Ico (High)
Lch Ico (Low)
Ico (thermal)
Rch Ico (Low)
Rch Ico (High) C05
DC DETECTOR
70°C (158°F) SENSOR
SIGNAL SENSOR 2V (L ch)
SIGNAL SENSOR 5V (L ch)
SIGNAL SENSOR 2V (R ch)
SIGNAL SENSOR 5V (R ch)
CLOCK OSC
VDD
RELAY DRIVE D03
D02
D01
preheat D00
OVER LOAD DETECTOR SNS1
SNS0
RESET
TST
stand by E03
auto E02
signal E01
thermal E00
C508 150P
VR501 10K
Z504 10K
RELAY DRIVE
C835 50V0.47
RELAY RLY801
Q509
R543 22K
R552 1.2K
C513 25V3.3
D528 (output on)
R557 180
D530 (preheat)
R540 47K
(stand by) D527
R551 270
R555 5.6K
R554 680
Q511
R556 56
D529 (auto)
D517 (signal)
D518 (thermal)
Q603
Ico CONTROL (L ch.)
R653 8.2K
R655 33K
Q617
R519 10K
D538
R525 5.6K
R526 22K
R528 22K
Q604
Ico CONTROL (R ch.)
R654 8.2K
R656 33K
Q618
R517 10K
IC501
Z501 56K
D522
⊕DC DETECTOR
⊖DC DETECTOR
Q503
D523
R506 100K
R505 100K
C505 16V47
Z501 5.6K
PS501 70°C (158°F) SENSOR
R536 47K
POWER AMP
+B
Q613
OVER LOAD DETECTOR
INVERTER
R545 47K
C523 25V3.3
Q508
R501 330
Q501
D503
R546 5.6K
R503 27K
C501 50V1
C511 25V4.7
R547 10K
POWER OUTPUT (L ch.)
Z601
D501
D505
R507 22K
R509 33K
R511 18K
R513 12K
C503 25V3.3
SIGNAL RECTIFIER
SIGNAL SENSOR (L ch.)
R502
Q502
D504
C502
R504
Z602
POWER OUTPUT (R ch.)
D502
D506
R508
R510
C504
R512
R514
SIGNAL SENSOR (R ch.)
Q614

■ BLOCK DIAGRAM

- Input selector / Equalizer / Volume control / Icq control / DC detector / Overload detector / Tap selector / Pri · Drive · Power amp. / Power supply circuit.

• Tuner block diagram, refer on page 26.


IC1 AN6558 EQUALIZER AMP.
RIAA
PHONO (L ch.)
PHONO (R ch.)
Q401
Q403
To Rch.
INPUT SELECTOR MUTING
IC402 MN6631 INPUT SELECT
AUX (L ch.)
AUX (R ch.)
To Rch.
IC401 MN6631 INPUT SELECT
From tuner circuit (R ch.)
From tuner circuit (L ch.)
S403 (TEPE DUBBING)
tape 2 ▶ 1
tape 1 ▶ 2
S404 (TAPE MONITOR)
tape 2/ext
source
S405 (TAPE MONITOR)
tape 1
TAPE 1
PLAYBACK (L ch.)
REC OUT (L ch.)
TAPE 2
IC404 MN6632 VOLUME CONTROLLER
Network resistor
Rf
MOS Tr. switch
D/A converter
Decoder
Reset circuit
Up/down counter
Divide counter
OSC circuit
Vcc detector circuit
IC405 SVINJM2043DD DC AMP.
From Rch.
To Rch.
LOUDNESS
S402 LOUDNESS
Q413
LOUDNESS SWITCH
S413 (FAST UP)
S414 (UP)
S415 (FAST DOWN)
S416 (DOWN)
VOLUME CONTROL SWITCH
IC406 SVITA7612AP VOLUME IND. DRIVE
IC407 SVITD6250IP INVERTER
VOLUME LEVEL IND.
IC408 SVITD6250IP INVERTER
To Rch. (Q412)
Q410
MUTING
S401 AUX
S411 TUNER
S412 PHONO
IC403 (1/3)
IC403 (2/3)
IC403 (3/3)
IC403 SVIμPD4011BC BAND SELECTOR
Q405 SWITCHING
Q406 SWITCHING
Q404 SWITCHING
PHONO IND.
AUX
TUNER
HIGH-CUT FILTER S602
S401 AUDIO MUTING
SUBSONIC FILTER S603
BALANCE CONTROL
IC601 SVINJM4559SM TONE AMP.
TONE
To Rch.
From Rch.
IC701 AN7062 VOLTAGE AMP.
LFB
Current mirror
Cascade
Current stabilizer
Bias
Muting
VOLTAGE AMP
Q72
Q601 Bias
Q605 Pre-drive
Q607 Pre-drive
Synchro-nous bias circuit
Q609 Driver
Q611 Driver
Q613 Power amp.
Q615 Power amp.
Q617 Bias control
HEADPHONES
From Rch.
(MAIN)
(REMOTE)
MAIN (L ch.)
REMOTE (L ch.)
IC801 AN6552 VOLTAGE COMPARATOR
VR801 (Impedance det. adj.)
VR802 (Impedance det. adj.)
Q501 OVER LOAD DETECTOR
Q508 SWITCHING
SIGNAL SENSOR
IC501
Reset switch
Reset circuit Q804
Q805 Tap select relay drive
Relay 802
From Rch.
Q802, 803 Diection signal generating circuit
DC DETECTOR CIRCUIT
Q503
IC501 INVERTER
IC502 INVERTER
Q510 SWITCHING
thermal
low
high
Q512 SWITCHING
IC502 INVERTER
Preheat
Thermal sensor PS501
IC501
Calculation of optimum bias
IC503 MN1421STA Icq CONTROL
Protection circuit
Muting
OUTPUT H
Clock OSC adj. (400kHz)
low
signal
auto
stand by
Q511 SWITCHING
Q801 Speaker select relay drive
Relay 801
OUTPUT ON
Q509 SWITCHING
IC502
POWER ON-OFF DETECTOR
Rectifier
Power transformer
high
low
AC Line

TERMINAL VOLTAGE OF BAND SELECTOR (IC403)

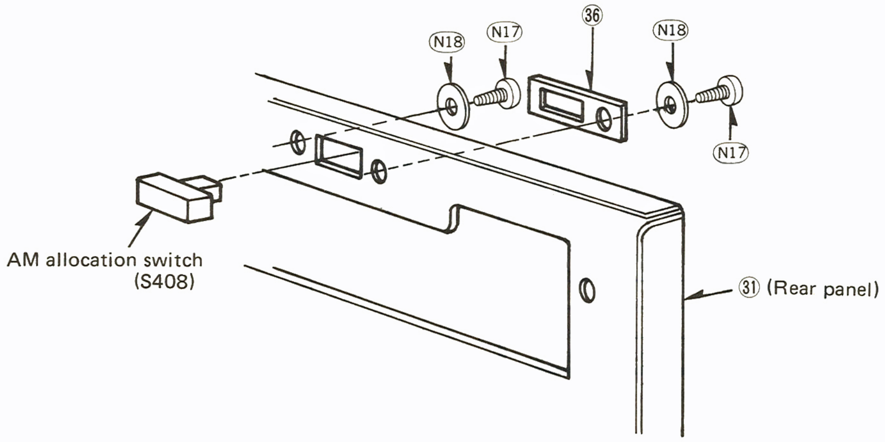
Pin No.	PHONO	TUNER	AUX
1	H	H	L
2	H	L	H
3	L	H	H
4	H	H	L
5	H	L	H
6	L	H	H
11	H	L	H
12	L	H	H
13	H	H	L

H → 15V
L → 0V

Ref. No.	Change of Part No. SA-510 [M]	➡ SA-510 [PA], [PE], [PC], [K-PC]	Part Name & Description	Per Set (Pcs.)	Remarks
3–1	SBC483–2	○ SBC483–2	Button (Silver)	1	
		Ⓚ SBC483–4	Button (Black)	1	
3–6	SDU193SA	SDU193SB	Dial Plate	1	
6	SDU89–1	○ SDU89–2	Filter (Silver)	1	
		Ⓚ SDU89–1	Filter (Black)	1	
8	SBD69–2M	○ SBD69–2M	Button (Silver)	1	
		Ⓚ SBD69–1M	Button (Black)	1	
9	SGX7515	○ SGX7515	Case (Silver)	1	
		Ⓚ SGX7515–1	Case (Black)	1	
16	SML137	SML137–3	Holder	1	
18	SJT345	SJT347	Terminal, Fuse	2	
26	RJA9Y	RJA52Z	Cord, Power Source	1	⚠ Ⓢ
27	RHR111	SHR127	Bushing	1	
31	SGP3730A	SGP3730–5A	Rear Panel	1	
33	SKC1430S1	○ SKC1430S1	Cabinet (Silver)	1	
		Ⓚ SKC1430BB1	Cabinet (Black)	1	
35	SSM175–4	○ SSM175–7	Meter (Silver)	1	
		Ⓚ SSM175–4	Meter (Black)	1	
36	Addition	SHR5025–1	Spacer, Allocation Switch	1	
SCREWS					
N15	SNE2095–2	○ SNE2095–2	Cabinet, (Silver)	4	
		Ⓚ SNE2095–3	Cabinet, (Black)	4	
N17	Addition	XSN26+6BV	Voltage Selector, ⊕2.6 x 6	2	Ⓢ
N18	Addition	XWA26BFZ	Voltage Selector, φ2.6	2	Ⓢ
ACCESSORIES					
A6	SQF11677–2	PA, PE SQF11847	Instruction Book (For PA, PE area)	1	
		PC SQF11847–1	Instruction Book (For PC area)	1	
A7	Addition	SJP9215	Plug Adaptor	1	⚠
PACKING PART					
P1	SPG4389	SPG4497	Carton Box	1	

EXPLODED VIEW

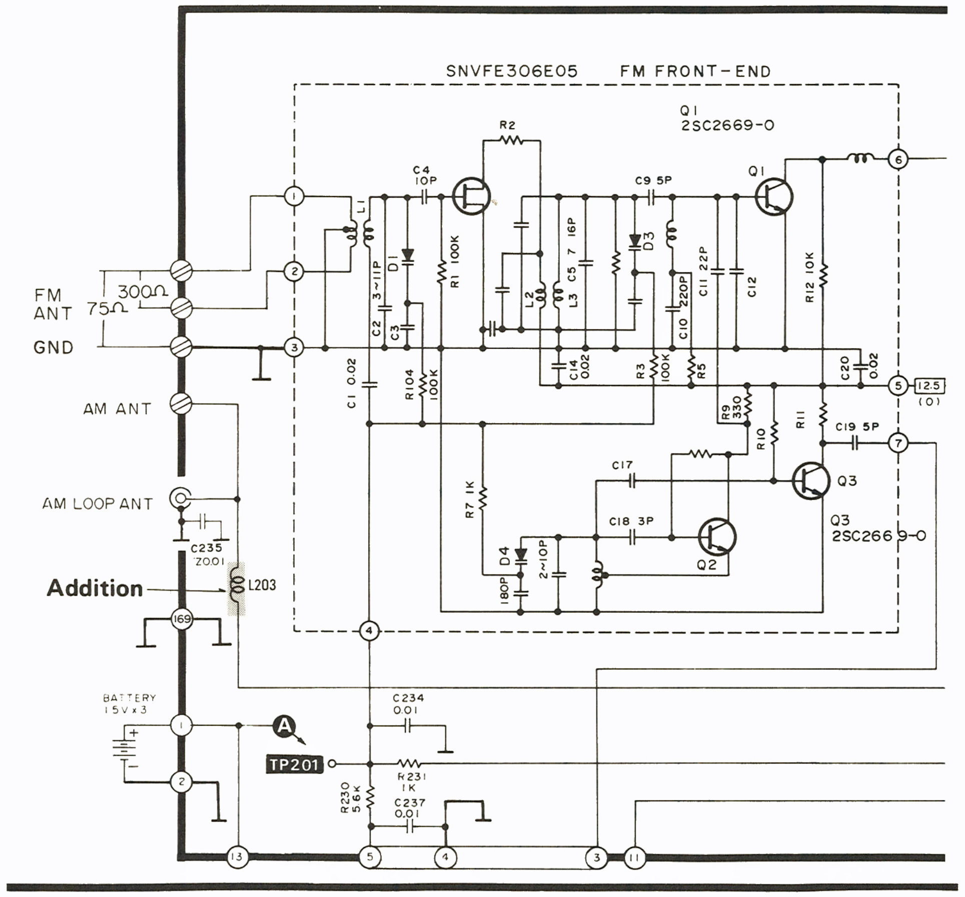
(Addition)

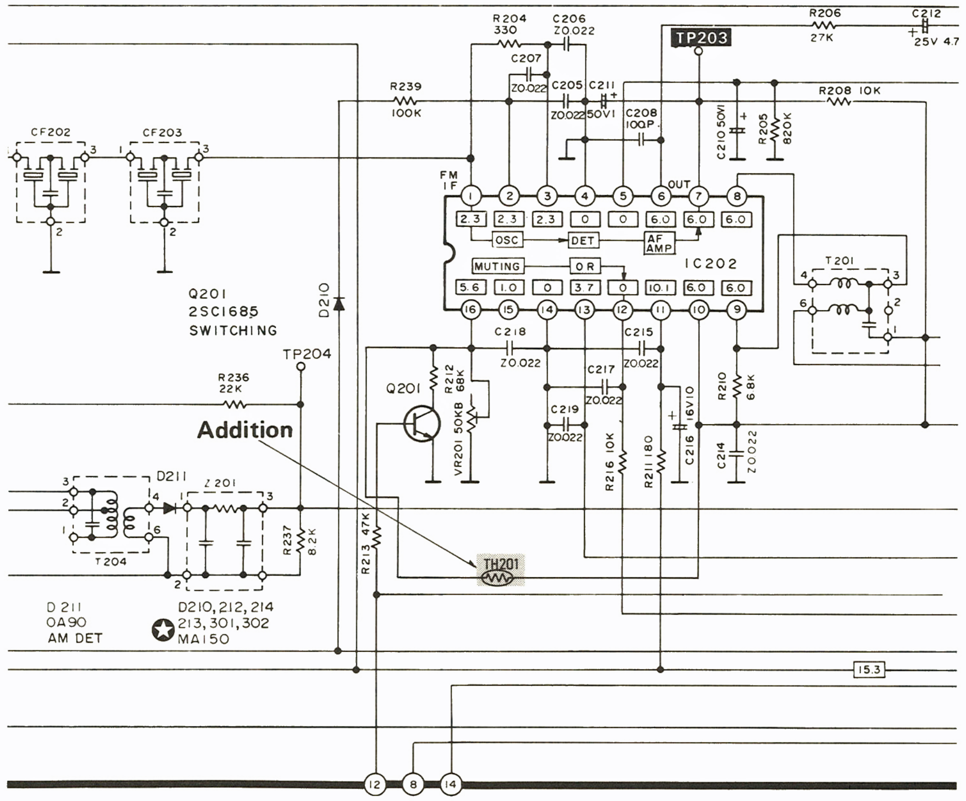

N18
N17
36
N18
N17
AM allocation switch
(S408)
31 (Rear panel)

■ CHANGE OF SCHEMATIC DIAGRAM

▨ **Deletion and addition**

■ FM/AM Tuner Circuit


SNVFE306E05 FM FRONT-END
Q1 2SC2669-O
Q3 2SC2669-O
Q2
FM ANT
300Ω
75Ω
GND
AM ANT
AM LOOP ANT
Addition
L203
C235
BATTERY 1.5V x 3
TP201
C234 0.01
R230 5.6K
R231 1K
C237 0.01


CF202
CF203
IC202
TP203
TP204
Q201 2SC1685 SWITCHING
Q201
VR201 50KB
R236 22K
Addition
TH201
D211
Z201
T201
T204
D211 OA90 AM DET
D210, 212, 214 213, 301, 302 MA150
OSC
DET
MUTING
AF AMP
OUT

■ SCHEMATIC DIAGRAM Ⓐ

(This schematic diagram may be modified at any time with the development of new technology.)

FM/AM TUNER CIRCUIT
FM/AM PRESET-TUNING CIRCUIT
AUTO SCAN/QUARTZ LOCK/SIGNAL STRENGTH IND.
EQUALIZER CIRCUIT
INPUT SELECTOR/VOLUME CONTROL CIRCUIT
NEW CLASS A IND.
VOLUME LEVEL IND. CIRCUIT
VOLTAGE AMPLIFIER CIRCUIT
TONE CONTROL/POWER AMP/REGULATOR CIRCUIT
HEADPHONES JACK
Ico CONTROLLER/RELAY DRIVE/OVER LOAD DET CIRCUIT
STAND BY/ON IND. CIRCUIT
AUTO/PRE-HEAT/SIGNAL/LOW/HIGH IND. CIRCUIT
PART NO: SNVFE306E05
FM FRONT-END ASS'Y
Color marking (Red or Black)
SFE 10.7 MHZ

Note 2:

- **Use of ceramic filters in pairs**

The ceramic filters (CF201 ~ CF203) for FM-IF circuit are available in two ranks. For this machine, be sure to use the ceramics of the same rank in a pair.
At repairing and replacement, pay close attention to the diode (D912) for use as different diodes must be used depending on each rank of the ceramic filters.

RANK (Color)	D912	CENTER FREQUENCY
Black	○	10.65 MHz
Red	X	10.70 MHz

Note: ○ Mark Diode is used.
X Mark Diode is not used.

■ SCHEMATIC DIAGRAM Ⓑ

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

1. **S2, 3** : Band selectors switch.
S2 —— AM S3 —— FM
2. **S4, 5** : Tuning control switch
S4 —— down (tuning to lower frequency)
S5 —— up (tuning to high frequency)
3. **S6** : Memory switch.
(manual ←→ auto)
4. **S7 ~ S14** : Preset tuning switch.
S 7 —— CH1 — CH 9 S11 —— CH5 — CH13
S 8 —— CH2 — CH10 S12 —— CH6 — CH14
S 9 —— CH3 — CH11 S13 —— CH7 — CH15
S10 —— CH4 — CH12 S14 —— CH8 — CH16
5. **S401** : Audio muting switch in "**0 dB**" position.
0dB ←→ 20dB
6. **S402** : Loudness switch in "**off**" position.
off ←→ on
7. **S403** : Tape dubbing switch in "tape 1 ▶ 2" position. tape 1 ▶ 2 ←→ tape 2 ▶ 1
8. **S404** : Tape monitor switch in "**source**" positon.
source ←→ tape 2/ext
9. **S405** : Tape monitor switch in "**source**" position.
source ←→ tape 1
10. **S410 ~ S412** : Input selectors switch.
S410 —— phono
S411 —— tuner
S412 —— aux/CD/video
11. **S413 ~ S416** : Volume control switch.
S413 —— fast up S415 —— fast down
S414 —— up S416 —— down
12. **S601** : FM muting/mode switch in "**on/FM auto**" position.
on/FM auto ←→ off/FM mono
13. **S602** : High-cut filter switch in "**off**" position.
off ←→ on
14. **S603** : Subsonic filter switch in "**off**" position.
off ←→ on
15. **S604** : Remote speaker switch in "**off**" positon.
off ←→ on
16. **S605** : Main speaker switch in "**on**" position.
off ←→ on
17. **S1001** : Power switch in "**on**" position.
18. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
   - * Figures in ▭ standard for DC voltage in FM signal (monaural signal) reception mode.
   - * Figures in < > standard for DC voltage in AM signal reception mode.
   - * Figure in ( ) stand for DC voltage in AM signal reception mode.

━	Positive voltage lines	⇢	AF signal lines
⇨	FM signal	□□□□▷	FM OSC
➡	AM signal	■■■■▶	AM OSC

19. The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part please use the part No. in the replacement part list.

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

■ REPLACEMENT PARTS LIST

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The " Ⓢ " mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the column of description stand for the quality per set.

Areas

* [M] is available in U.S.A.
* [MC] is available in Canada.

INTEGRATED CIRCUITS

Ref. No.	Part No.	Description
IC71	AN7062	Voltage Amp.
IC201	SVIUPC1018C	FM IF & AM Convertor
IC202	SVIUPC1167C2	FM IF Det.
IC301	SVIUPC1161C3	MPX
IC401,402	MN6631	Input Selector
IC403	SVIUPD4011BC	LED(Input) Controller
IC404	MN6632	Volume Controller
IC405	SVINJM2043DD	DC Amp.
IC406	SVITA7612AP	Volume Ind.Drive
IC407,408	SVITD62501P	Inverter
IC501,502	SVITD62501P	Inverter
IC503	MN1421STA	ICQ Controller
IC601	SVINJ4559DSM	Flat Amp.
IC801	AN6552F	Voltage Comparator
IC901	SVID1704C525	PLL Controller
IC902	SVIUPB553AC	Pre Scaler
IC903	AN6873N	FL Driver
IC904	SVIUPD4011BC	OSC Scan Ind. Controller

TRANSISTOR

Ref. No.	Part No.	Description
Q71,72	2SA1123-R	Voltage Amp.
Q201～206,209 210 Ⓢ	2SC1685-Q	Switching,Signal Strength Ind. Driver
Q207,208 Ⓢ	2SA722-S	FM/AM Selector
Q301,302 Ⓢ	2SC1685-Q	Muting
Q303 Ⓢ	2SA722-S	Muting Control
Q304 Ⓢ	2SC1685-Q	Tuner Muting
Q401,402	2SD1011-S	Muting
Q403～406 Ⓢ	2SA722-S	Muting
Q408,409 Ⓢ	2SA684-QNC	Regulator
Q410～413	2SJ103-GR	Tone Amp.Switch, Loudness Switch
Q501,502	2SC1845-E	Over Load Detector
Q503,508 Ⓢ	2SA722-S	DC Detector
Q509 Ⓢ	2SC1509FQ	Switching
Q510,511 Ⓢ	2SA722-S	Switching
Q512 601,602 Ⓢ	2SC1685-Q	LED,Drive,Bias Controller, Regulator
Q603～606	2SC2631-R	ICQ Controller, Pre Drive
Q607,608	2SA1123-R	Pre Drive
Q609,610	2SC2824-Y	Driver } Use Pair
Q611,612	2SA1184-Y	Driver } Ranks
Q613,614	2SC3182-R	Power } Use Pair
Q615,616	2SA1265-R	Power } Ranks
Q617,618	2SA992	ICQ Controller
Q801	2SC1845	Speaker Select Relay Drive
Q802～804 Ⓢ	2SA722-S	Detection Signal Generating Circuit
Q805	2SA992	Tap Relay Drive
Q806 Ⓢ	2SC1383Q	Regulator
Q807 Ⓢ	2SD762-Q	Regulator
Q808 Ⓢ	2SC1685-Q	Regulator
Q809 Ⓢ	2SA684-QNC	Regulator
Q810,811 Ⓢ	2SD762-Q	Regulator
Q901,902 Ⓢ	2SC945-Q	Loop Filter
Q903,904 Ⓢ	2SC1685-Q	FM/AM Scale Adj.
Q907 Ⓢ	2SA722-S	Scan Ind.Drive

DIODES

Ref. No.	Part No.	Description
D71,72 Ⓢ	MA162A	Switching
D201,202,205,527	LN446YP	LED,Signal Strength(1,2) Scan,Output (Stand by)
D203,528	LN346GP	LED,Signal Strength(3) Output(on)
D204	LN846RP	LED,Quartz Lock
D206	SVDMZ303BM	3V,Zener
D207,817,917	MA1062M	6.2V,Zener
D208 Ⓢ	SVDKV1236Z	AM Variable Capacitor
D210,301,302 Ⓢ	MA162A	Switching
D211 Ⓢ	20A90	Detector,Bias
D212～215 Ⓢ	MA162A	Switching
D401～403	SVDMC921	Switching
D404～410 Ⓢ	MA162A	Switching
D413,414	MA1030L	3V,Zener
D415,529	LN0603QP3G	LED,New Class A,Computer Drive Monitor(auto)
D420～429	LN41YPHLMS	LED,Volume Level Ind.
D432～438	LN846RP	LED,Input Selector
D440	SVDMZ309A	9V,Zener
D501～506 522 Ⓢ	MA162A	Switching
D523	MA27W-A	Bias
D526 Ⓢ	20A90	Detector,Bias
D530	LN0202YP4	LED.Preheat
D531～537	SVDAY5533K-M	LED Computer Drive Monitor
D538	SVDMC921	Switching
D601,602	MA27W-A	Bias
D603～610 Ⓢ	20A90	Detector,Bias
D611～614	MA27W-A	Bias
D615	MA1180M	18V,Zener
D801～806 Ⓢ	MA162A	Switching
D808～811 ⚠ Ⓢ	SVDS3V40	Rectifier
D812～816 820 ⚠ Ⓢ	SVDSR1K2	Rectifier
D818,822 Ⓢ	SVDRD16EB	16V,Zener
D819	MA1270M	27V,Zener
D821	SVDMZ308B	8V,Zener
D824 Ⓢ	MA162A	Switching
D901～913 Ⓢ	MA162A	Switching
D918～921 Ⓢ	MA162A	Switching

COILS

Ref. No.	Part No.	Description
L201	SL02C29R-P	AM OSC
L202	SLA2C5-P	AM Antenna
L501	SLQX101-3M	Choke
L601,602	SLQY15G-30	Choke

FUSE

Ref. No.	Part No.	Description
F1 ⚠	XBA1F40NU14	Power Source, 125V,4A

RELAYS

Ref. No.	Part No.	Description
RLY801 ⚠	SSY107-1	Speaker
RLY802	SSY109-1	Tap Select

TRANSFORMERS

Ref. No.	Part No.	Description
T1 ⚠	SLT5N419	Power Source
T201	SLI4C541-Z	FM IFT
T202	SLI4C543-Z	FM IFT
T203	SLI2C127-M	AM IFT
T204	SLI2C413	AM IFT

VARIABLE RESISTORS

Ref. No.	Part No.	Description
VR201	EVN58AA00B54	Muting on Level Adj,50KΩ(B)
VR301	EVN75AA00B53	VCO,5KΩ(B)
VR302	EVN58AA00B55	Separation Adj,500KΩ(B)
VR501 Ⓢ	EVNM0AA00B14	Clock Frequency Adj,10KΩ(B)
VR601,602	EVNK6AA00B52	ICQ Adj,500Ω(B)
VR603	EVD00305G15S	Balance,100KΩ(G)
VR604,605	EWD00205C15S	Bass,Treble, 100KΩ(C)
VR801,802	EVNK6AA00B14	Tap Selector, 10KΩ(B)
VR901	EVN58AA00B53	Freguency Meter Adj,5KΩ(B)

VARIABLE CAPACITOR

Ref. No.	Part No.	Description
CT201	SVCTY121B269	Trimmer,AM Antenna

COMPONENT COMBINATIONS

Ref. No.	Part No.	Description
Z201	EXRF203Z471S	0.02μF,470Ω
Z301,302	EXRP181K473C	180pF,47KΩ
Z401,501	EXBP87562K	5.6KΩ(X7)
Z504	EXBP84103J	10KΩ(X4)
Z601,602	ERF3GBKR22N	3W,0.22Ω
Z901	EXBP87104M	100KΩ(X7)
Z902	EXFP7331MW	330pF(X7)

FLUORESCENT DISPLAY TUBE

Ref. No.	Part No.	Description
	SAD7MT29ZA	Digital Frequency Display

FM FRONT END

Ref. No.	Part No.	Description
	SNVFE306E05	

THERMISTORS

Ref. No.	Part No.	Description
PS501	SRPBG47101	Thermal Det.
TH601,602	RRT104	100KΩ
TH901	ERTD2ZHL103S	10KΩ

CERAMIC FILTERS

Ref. No.	Part No.	Description
CF201～203	SVFE107MM-A	FM,10.7MHz(Red)
	SVFE107MM-D	FM,10.65MHz (Black)
CF204	SVFSFP450HT	AM,450KHz
	(Use pair ranks as same as CF201,CF202 and CF203)	

SWITCHES

Ref. No.	Part No.	Description
S2～14,410～416	SSG13	Band Selector, Tuning Memory Preset Tuning, Input Volume Control
S401	SSH1101	Audio Muting
S402	SSH1031	Loudness
S403～405	SSH3055	Tapemonitor, Tape-dubbing
S601～603	SSH1031	High-cut Filter, Subsonic Filter, FM Muting/ FM Mode
S604,605	SSH2059	Speaker Selector
S1001 ⚠	SSH1071	Power Source

CRYSTAL

Ref. No.	Part No.	Description
X901	SVQ49U452-T	4.5MHz

LAMPS

Ref. No.	Part No.	Description
PL401,402	XAMR68S8	Volume Control (8V,0.07A)

CABINET and CHASSIS PARTS

Ref. No.	Part No.	Description
1	SGW4650PA	Front Panel (1)
2	SGU347SA	Transparent Plate (1)
3	SGXA510M	Front Sub Panel Ass'y (1)
3-1	SBC483-2	Button,Speaker (2)
3-2	SBC565-1M	Button,Selector (8)
3-3	SHR5247	Spacer,Selector (1)
3-4	SHR5255	Spacer,Selector (1)
3-5	SUS257	Spring (10)
3-6	SDU193SA	Dial Plate (1)
4	SDH553	Reflector Plate (1)
5	SFUMC10-23	Connection Rod,Volume (2)
6	SDU89-1	Filter FL (1)
7	SBC337-1M	Button,Power (1)
8	SBD69-2M	Button,Bass,Treble Balance (3)
9	SGX7515	Case,Bass Treble Balance (1)
10	SBZ663-1	Connection Rod,Bass Treble,Balance (3)
11	SHR9667	Spacer (8)
12	SHR415	Pin,P.C.B (2)
13	SKU10530	Bottom Board (1)
14	SUW2025	Bracket,P.C.B (1)
15	SKL249	Foot (4)
16	SML137	Holder (1)
17	SJJ71B	Jack,Headphone (1)
18	SJT345	Crip,Fuse (2)
19	SMX515	Insulation Sheet (1)
20[M] ⚠	SJS9221-1	Socket (2)
20[MC] ⚠	SJS9223	Socket (2)
21	SJF4815-2	Terminal,Speaker (1)
22	SJF3247-2N	Terminal,AM Antenna (1)
23	SJF4419-4	Terminal,FM Antenna (1)
24	SJF3057N	Terminal Input (1)
25	SJF3055-5N	Terminal Input (1)
26[M] ⚠	RJA9Y	Cord,Power Source (1)
26[MC] ⚠	SJA109	Cord,Power Source (1)
27[M]	RHR111	Bushing,AC Cord (1)
27[MC]	SHR129	Bushing,AC Cord (1)
28	SJB3005-1	Case,Battery (1)
29	SJC7	Terminal Battery (2)
30	SJC9	Terminal Battery (2)
31[M]	SGP3730A	Rear Panel (1)
31[MC]	SGP3730-1A	Rear Panel (1)
32	SUW2057	Bracket,FL (2)
33	SKC1430S1	Cabinet (1)
34	SMX767	Insulation Sheet, Power Tr. (2)
35	SSM175-4	Meter (1)
36	SHR301	Cramper,Read Wire (2)

SCREWS

Ref. No.	Part No.	Description
N1 Ⓢ	XTB3+10BFN	Tapping,⊕3×10 (3)
N2 Ⓢ	XSN3+8S	⊕3×8 (2)
N3 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (2)
N4 Ⓢ	XSN3+6S	⊕3×6 (2)
N5 Ⓢ	XSN3+6S	⊕3×6 (2)
N6 Ⓢ	XSN3+6S	⊕3×6 (2)
N7 Ⓢ	XTB4+8BFN	Tapping,⊕4×8 (4)
N8 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (4)
N9 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (3)
N10 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (3)
N11 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (1)
N12 Ⓢ	XTB3+8BFZ	Tapping,⊕3×8 (4)
N13 Ⓢ	XTB3+8BFZ	Tapping,⊕3×8 (3)
N14 Ⓢ	XTB3+8BFZ	Tapping,⊕3×8 (3)
N15	SNE2095-2	Cabinet (4)
N16 Ⓢ	XTB3+8BFN	Tapping,⊕3×8 (2)

WASHERS

Ref. No.	Part No.	Description
N20 Ⓢ	XWA3B	Spring,φ3 (2)
N21 Ⓢ	XWA3B	Spring,φ3 (2)
N22 Ⓢ	XWA3B	Spring,φ3 (2)
N23 Ⓢ	XWG3	Plain,φ3 (2)
N24 Ⓢ	XWG3	Plain,φ3 (4)
N25 Ⓢ	XWG3	Plain,φ3 (3)
N26 Ⓢ	XWG3	Plain,φ3 (1)
N27 Ⓢ	XWA3B	Spring,φ3 (3)

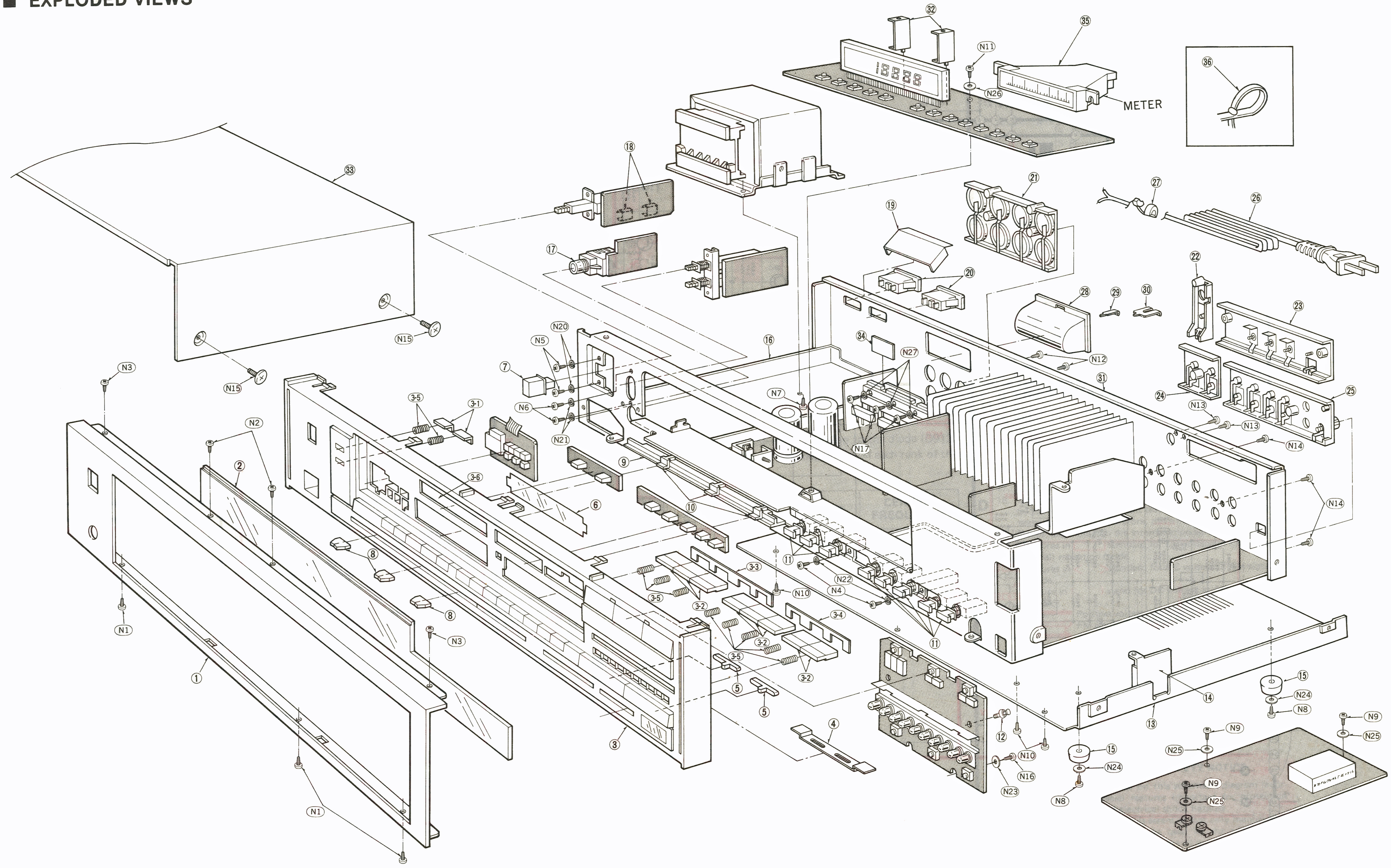
ACCESSORIES

Ref. No.	Part No.	Description
A1	SSA611-1	Loop Antenna(AM) (1)
A2	SMA231	Holder (1)
A3	SMA233-1	Holder (1)
A4	XTN3+10AFZ	Screw (2)
A5	SSA267-1	Cord, Antenna(FM) (1)
A6[M]	SQF11677-2	Instruction Book (1)
A6[MC]	SQF11679	Insutruction Book (1)

PACKING PARTS

Ref. No.	Part No.	Description
P1[M]	SPG4389	Carton Box (1)
P1[MC]	SPG4381	Carton Box (1)
P2	SPS3015-3	Pad,Left (1)
P3	SPS3017-2	Pad,Right (1)
P4	SPS4059	Pad,Upper (1)
P5	SPP723	Polythylene Bag (1)

EXPLODED VIEWS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N11
N26
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3-4
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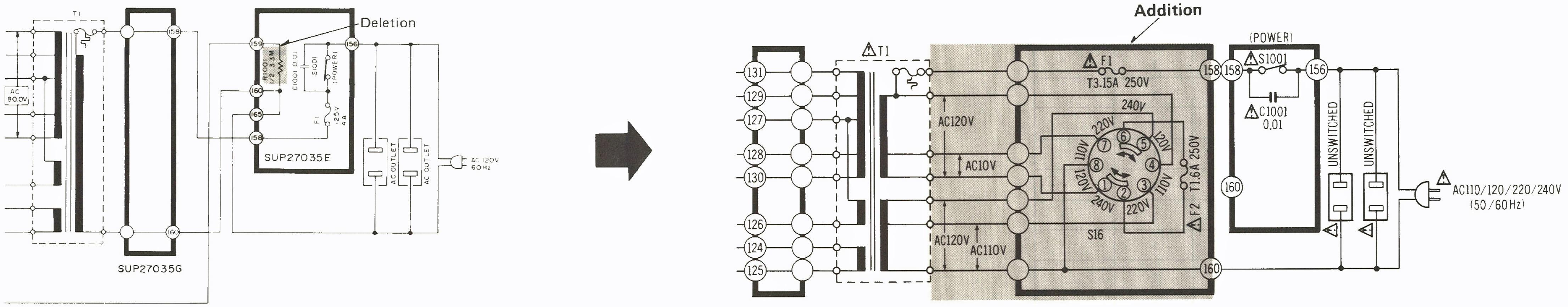
⑪
3-5
3-2
①
⑤
⑤
⑮
N24
N8
⑭
④
⑬
N9
⑫
N25
N9
N10
③
N16
⑮
N25
N24
N23
N8
N9
N25
N1

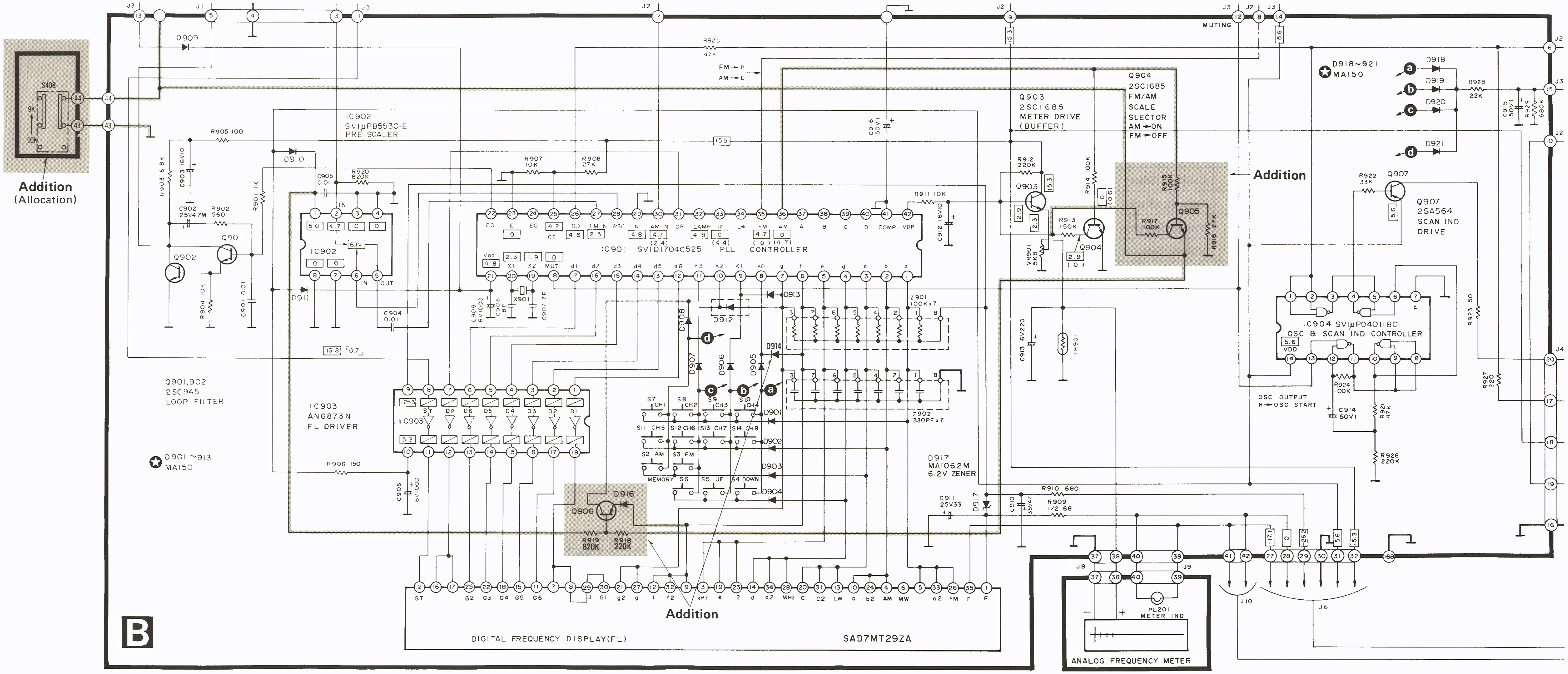
Printed in Japan
830504400 Ⓗ YK/IM
830600800

Power Source Circuit

- Power source circuit


T1
AC 80.0V
SUP27035G
Deletion
R1001 1/2 3.3M
C1001 0.01
S1001 (POWER)
F1 250V 4A
SUP27035E
AC OUTLET
AC OUTLET
AC 120V 60Hz
Addition
⚠T1
131
129
127
128
130
126
124
125
AC120V
AC10V
AC120V
AC110V
⚠F1
T3.15A 250V
240V
220V
120V
110V
240V
220V
110V
120V
⚠F2 T1.6A 250V
S16
158
160
(POWER)
⚠S1001
156
⚠C1001
0.01
UNSWITCHED
UNSWITCHED
⚠AC110/120/220/240V
(50/60Hz)

FM/AM Preset Tuning Circuit


S408
9K
10K
Addition
(Allocation)
D909
R905 100
R903 6.8K
C903 16V10
C902 25V4.7M
R902 560
R901 1K
Q901
Q902
R904 10K
C901 0.01
D910
D911
C905 0.01
R920 820K
IC902
SVIµPB553C-E
PRE SCALER
C904 0.01
R907 10K
R906 27K
R925 47K
FM→H
AM→L
C916 50V1
IC901 SVIDI704C525 PLL CONTROLLER
R911 10K
C912 16V10
C909 6V1000
C908 18P
X901
C907 7P
Z901 100K×7
Z902 330PF×7
D912
D913
D914
D908
D907
D906
D905
S7 CH1
S8 CH2
S9 CH3
S10 CH4
S11 CH5
S12 CH6
S13 CH7
S14 CH8
S2 AM
S3 FM
MEMORY S6
S5 UP
S4 DOWN
D901
D902
D903
D904
Q901,902
2SC945
LOOP FILTER
IC903
AN6873N
FL DRIVER
D901~913
MA150
R906 150
C906 6V1000
D916
Q906
R919 820K
R918 220K
Addition
DIGITAL FREQUENCY DISPLAY(FL)
SAD7MT29ZA
Q903
2SC1685
METER DRIVE
(BUFFER)
Q904
2SC1685
FM/AM
SCALE
SLECTOR
AM→ON
FM→OFF
R912 220K
R914 100K
R915 100K
R913 150K
VR901 5KB
R917 100K
Q905
R916 27K
Addition
C913 6V220
TH901
D917
MA1062M
6.2V ZENER
C911 25V33
C910 35V47
R910 680
R909 1/2 68
PL201
METER IND
ANALOG FREQUENCY METER
D918~921
MA150
D918
D919
D920
D921
R928 22K
C915 50V1
R929 680K
R922 33K
Q907
2SA564
SCAN IND
DRIVE
IC904 SVIµPD4011BC
OSC & SCAN IND CONTROLLER
R924 100K
C914 50V1
R921 47K
R926 220K
OSC OUTPUT
H→OSC START
R923 150
R927 220
MUTING
J1
J2
J3
J4
J6
J8
J9
J10
B

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